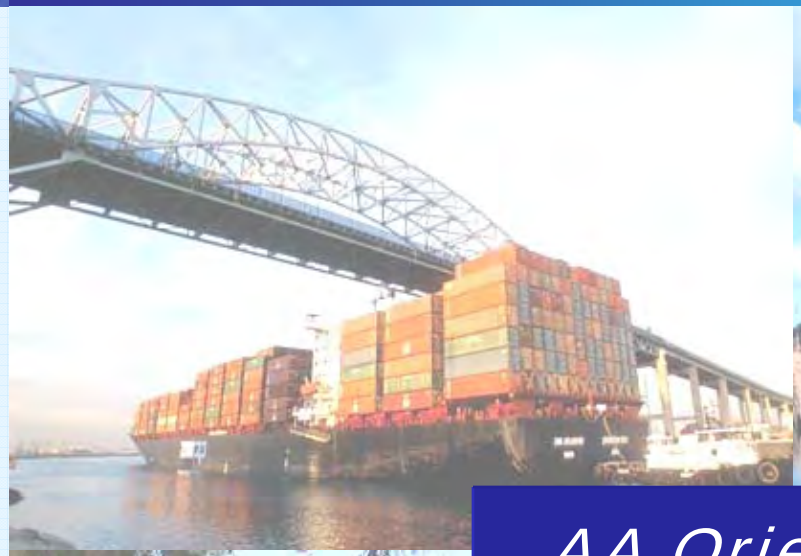
Center for Operational Oceanographic Products & Services



AA Orientation

National Ocean Service

Mike Szabados, Director

VISION & MISSION

Vision: A Nation where ***everyone*** has ***ready access*** to tide, current, water level, and other coastal ***oceanographic products*** and services required for ***informed decision-making.***

Mission: Provide the ***National infrastructure, science,*** and ***technical expertise*** to monitor, assess and distribute ***tide, current, water level,*** and ***other coastal oceanographic products*** **and services** necessary to support NOAA's Mission Goals.

CO-OPS SUPPORTS ALL FIVE GOALS

Commerce & Transportation

Climate

Ecosystem

Weather & Water

Mission Support

"One NOAA"

AA Orientation

APPLICATIONS

Marine Navigation & Safety

Wetlands Restoration & Monitoring

Coastal & Environmental Planning & Assessment

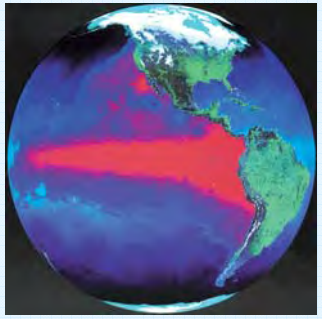
Storm Surge Monitoring

Emergency & Hazardous Response

Tsunami Warning

Marine Forecasting

Shoreline & Marine Boundaries



Sea Level Change & Variability

ECOSYSTEM GOAL

HARMFUL ALGAL BLOOM OPERATIONAL FORECAST SYSTEM (HAB-OFS)

BENEFITS:

Assists Coastal Managers in Bloom Identification

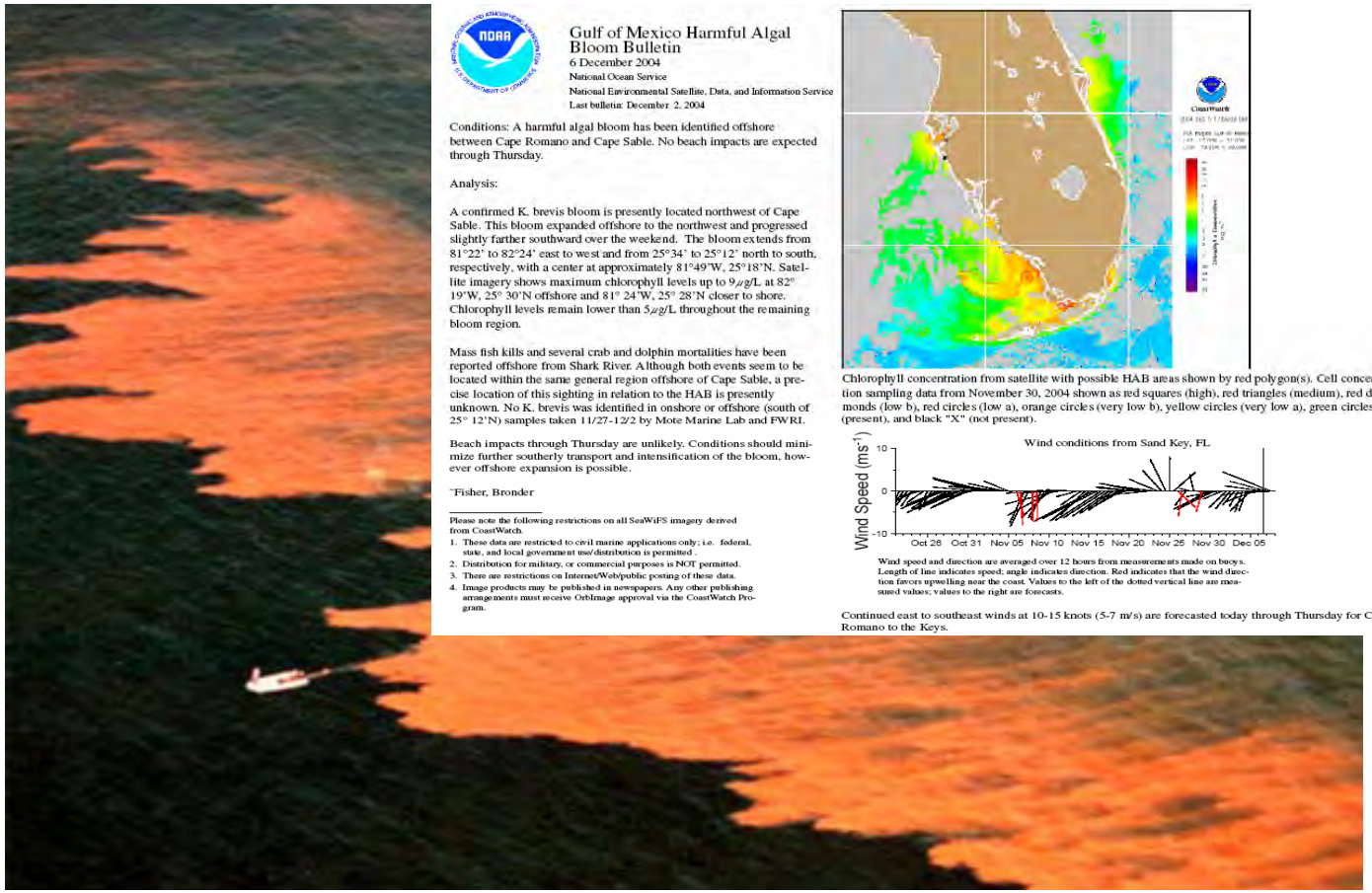
Provides Human Health Warnings Bi-Weekly

98% Forecast Accuracy

FY06:

Continuing Funding Issue

Harmful Algal Bloom Report



Gulf of Mexico Harmful Algal Bloom Bulletin
6 December 2004
National Ocean Service
National Environmental Satellite, Data, and Information Service
Last bulletin: December 2, 2004

Conditions: A harmful algal bloom has been identified offshore between Cape Romano and Cape Sable. No beach impacts are expected through Thursday.

Analysis:

A confirmed K. brevis bloom is presently located northwest of Cape Sable. This bloom expanded offshore to the northwest and progressed slightly farther southward over the weekend. The bloom extends from 81°22' to 82°24' east to west and from 25°34' to 25°12' north to south, respectively, with a center at approximately 81°49'W, 25°18'N. Satellite imagery shows maximum chlorophyll levels up to 9 μg/L at 82° 19'W, 25° 30'N offshore and 81° 24'W, 25° 28'N closer to shore. Chlorophyll levels remain lower than 5 μg/L throughout the remaining bloom region.

Mass fish kills and several crab and dolphin mortalities have been reported offshore from Shark River. Although both events seem to be located within the same general region offshore of Cape Sable, a precise location of this sighting in relation to the HAB is presently unknown. No K. brevis was identified in onshore or offshore (south of 25° 12'N) samples taken 11/27-12/2 by Mote Marine Lab and FWRI.

Beach impacts through Thursday are unlikely. Conditions should minimize further southerly transport and intensification of the bloom, however offshore expansion is possible.

"Fisher, Bronder

Please note the following restrictions on all SeaWiFS imagery derived from CoastWatch.
1. These data are restricted to civil marine applications only; i.e. federal, state, and local government use/distribution is permitted.
2. Distribution for military, or commercial purposes is NOT permitted.
3. There are restrictions on Internet/Web/public posting of these data.
4. Image products may be published in newspapers. Any other publishing arrangements must receive OrbImage approval via the CoastWatch Program.

Chlorophyll concentration from satellite with possible HAB areas shown by red polygon(s). Cell concentration sampling data from November 30, 2004 shown as red squares (high), red triangles (medium), red diamonds (low b), red circles (low a), orange circles (very low b), yellow circles (very low a), green circles (present), and black "X" (not present).

Wind speed and direction are averaged over 12 hours from measurements made on buoys. Length of line indicates speed; angle indicates direction. Red indicates that the wind direction favors upwelling near the coast. Values to the left of the dotted vertical line are measured values; values to the right are forecasts.

Continued east to southeast winds at 10-15 knots (5-7 m/s) are forecasted today through Thursday for Cape Romano to the Keys.

Partnership with NCCOS, CSC and NESDIS

USERS: Coastal Managers, Beach-going Public, Fish & Shellfish Industries

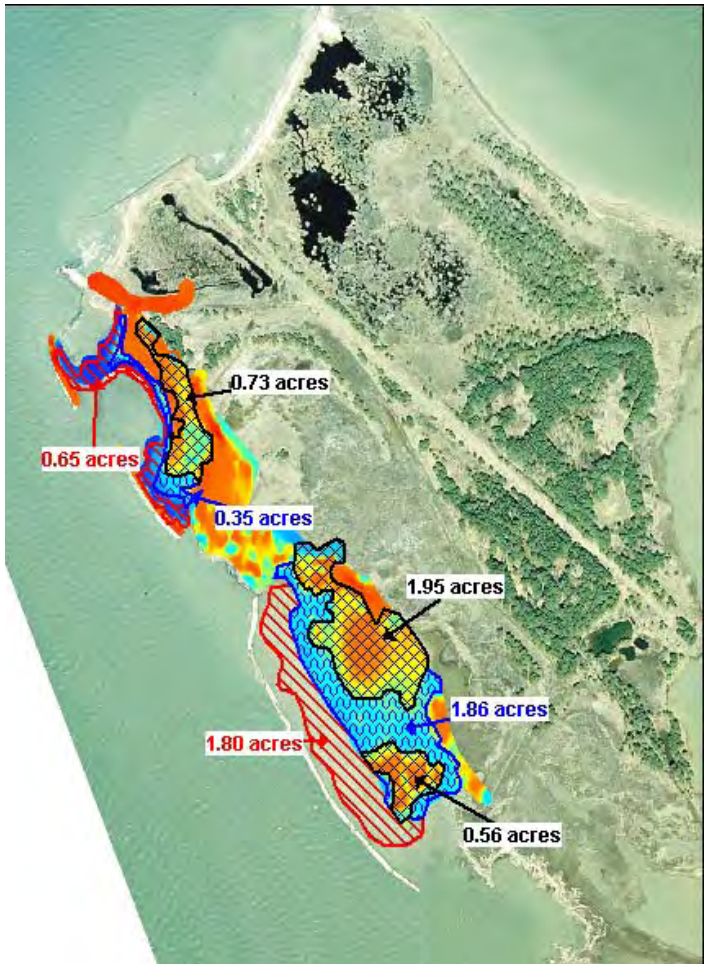
ECOSYSTEM GOAL

COASTAL OCEANOGRAPHIC APPLICATIONS (COASTAL)

BENEFITS:
Marsh & Wetland Restoration based on plant sensitivity to Inundation

FY06:
Creation of new GIS tools (MAPTITE)

Ecosystem Approach to Management



Re-engineering of the Wetlands - 2004

"The wetlands have never been healthier."
-Glen Page
Director of Conservation, NAIB
April 2005

USERS: Coastal Managers, Local, State Gov., NOAA, USFWS, USACE

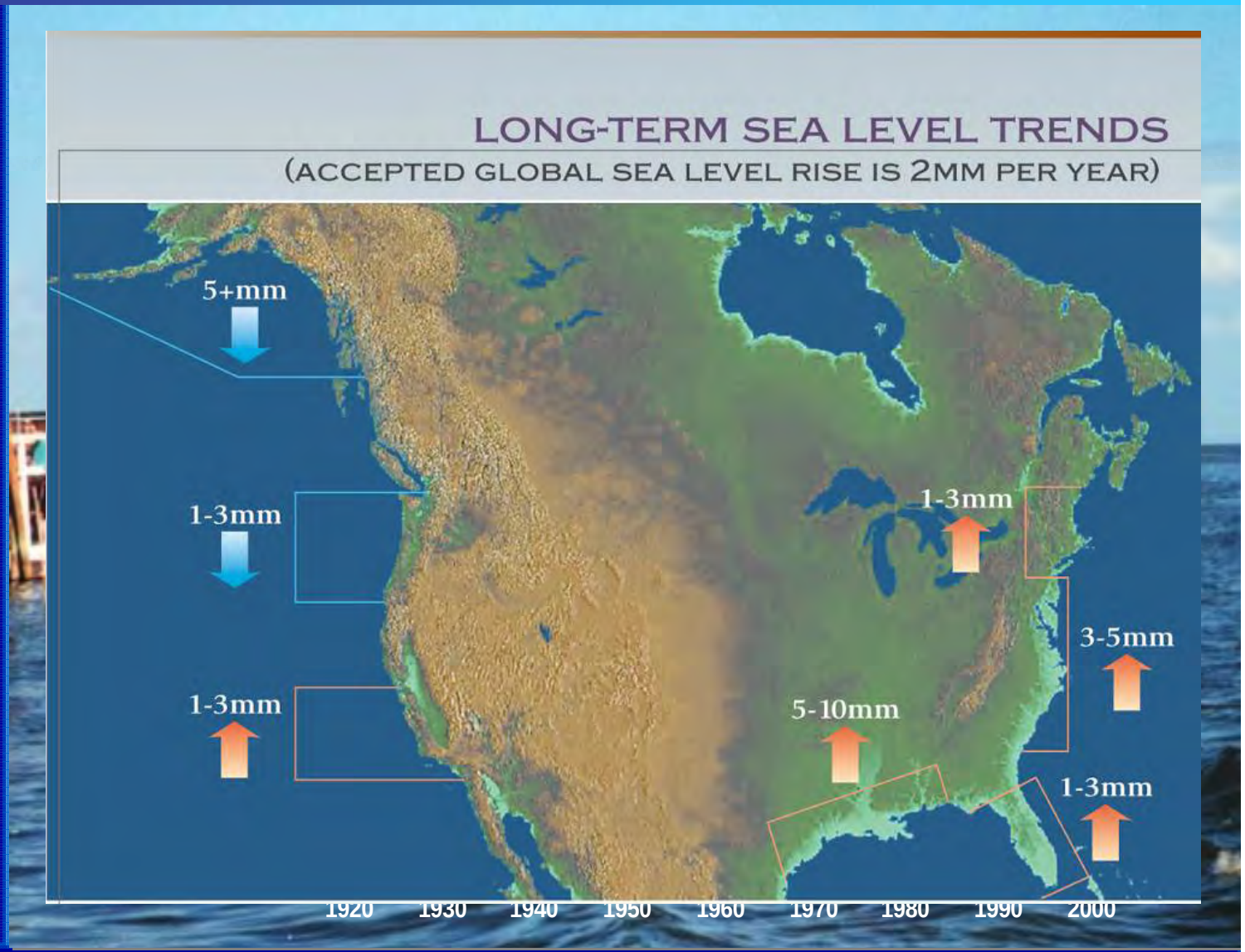
CLIMATE GOAL
SEA LEVELS ONLINE

Providing National Sea Level Trends

Growing Public Concern 1, 50, 100 Year Extreme Storm Events

Extreme Storm Event Analysis

FY06:
Expanded Nation Wide Analysis to Global Sea Level



USERS: *Climate Scientists, Local, State, Federal & International Government*

CLIMATE GOAL

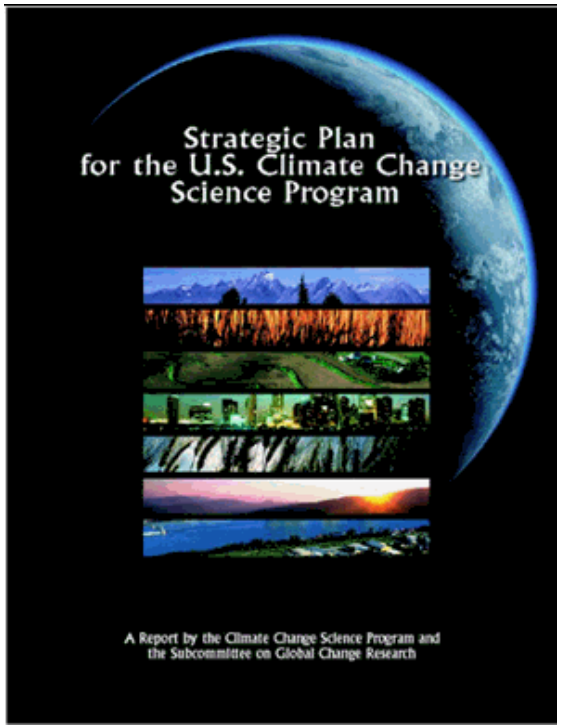
U.S. CLIMATE CHANGE SCIENCE PROGRAM (USCCSP)

Coastal Elevation & Sensitivity to Sea Level Rise”

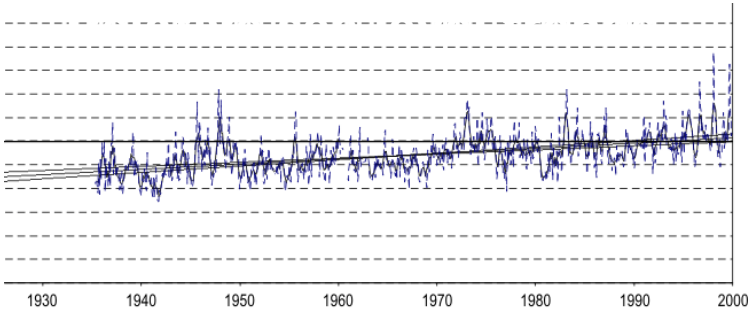
Contributing NOAA Lead To US Climate Analysis

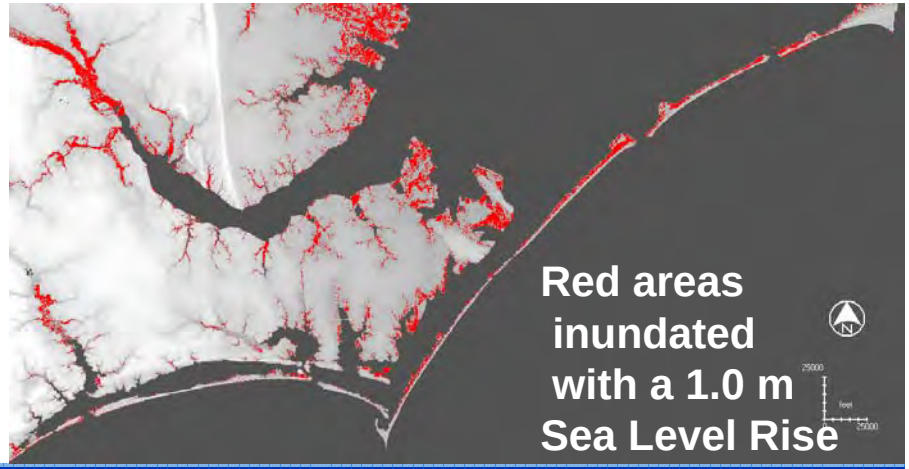
OBJECTIVE:
How well is society equipped to cope with potential sea level rise.

FY07:
Final Report Due



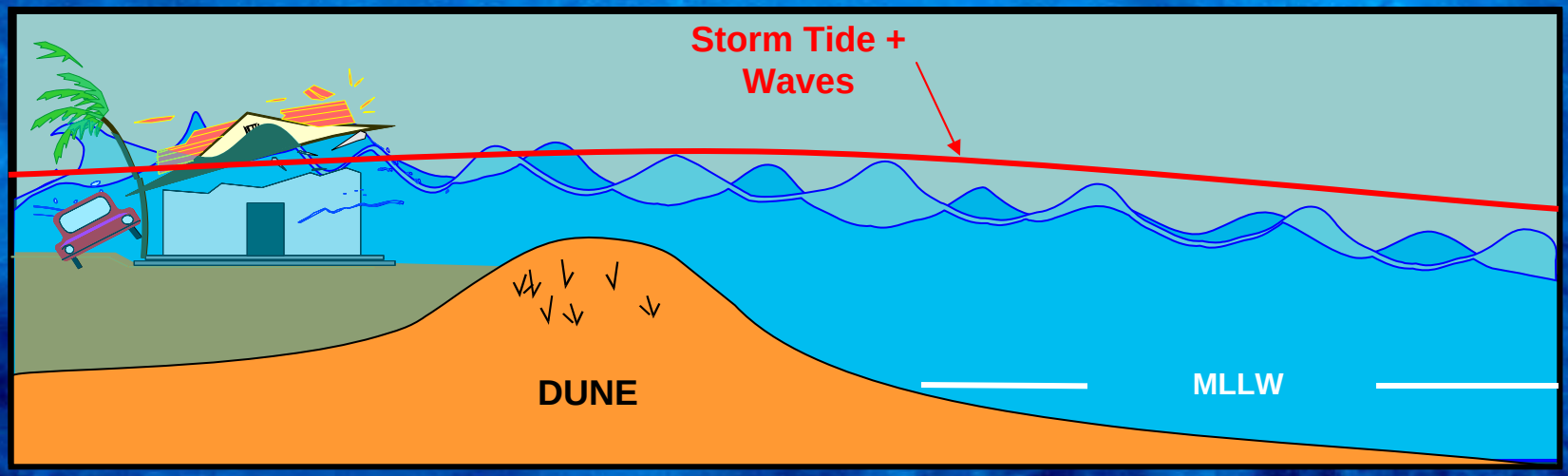
Wilmington, NC
Sea Level Change





PARTNERS: EPA, NOAA, USCOE, FEMA, USGS

WEATHER & WATER GOAL OVERVIEW



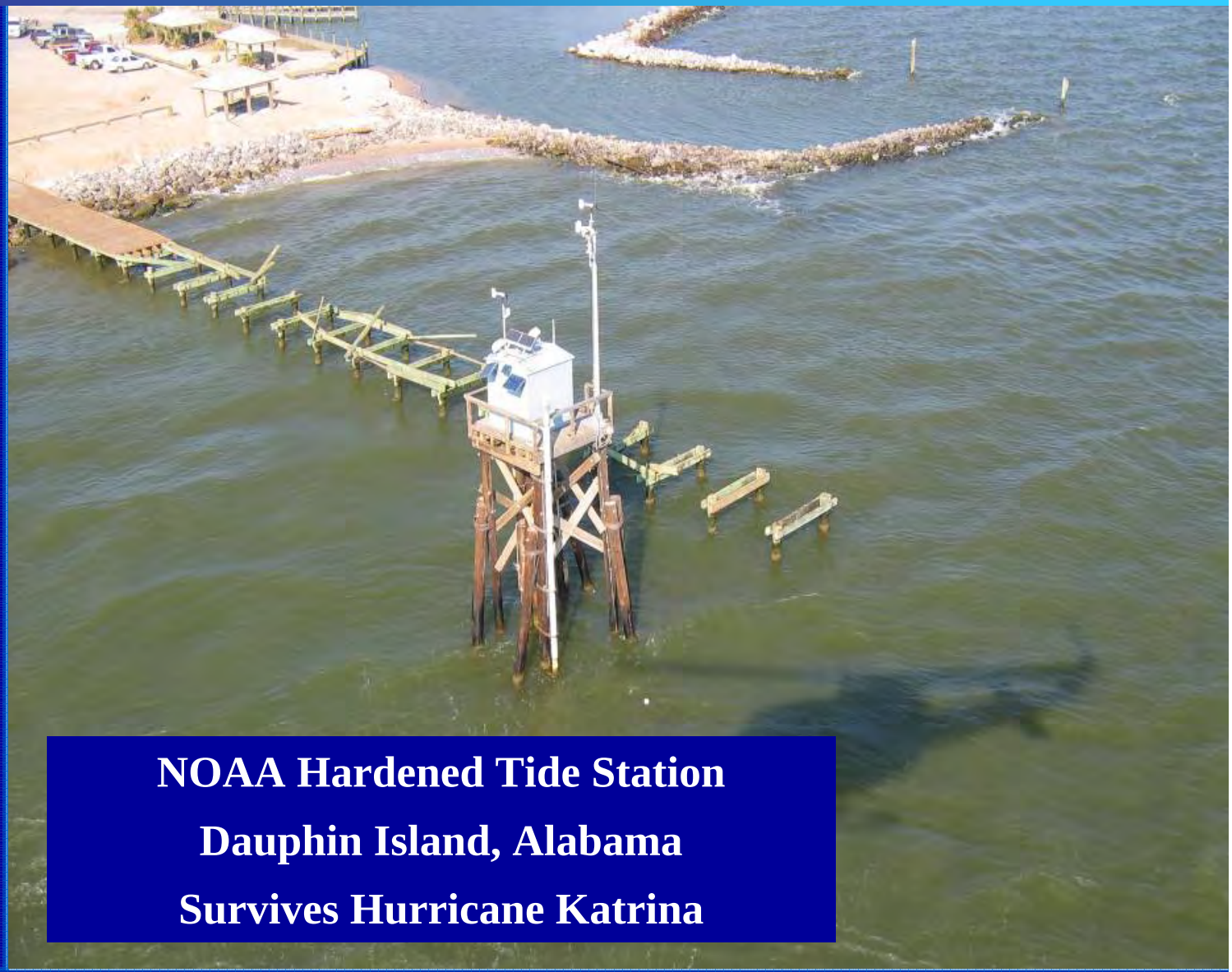
WEATHER & WATER GOAL

NATIONAL WATER LEVEL PROGRAM (NWLP)

One Stop Look at Rising Water Levels in Storm Track

Assists Coastal Managers with Emergency Flood Planning

FY06:
Storm Surge & Storm Tide Support & Analysis



NOAA Hardened Tide Station
Dauphin Island, Alabama
Survives Hurricane Katrina

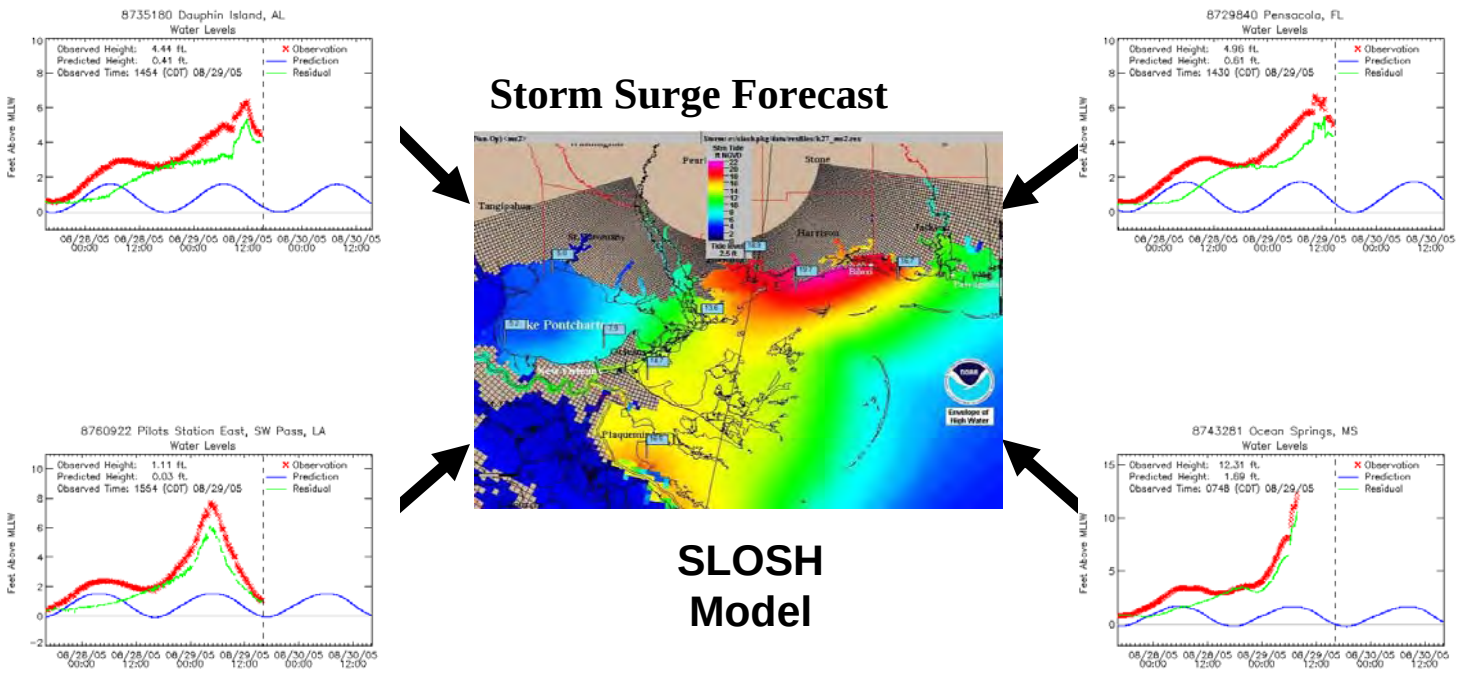
USERS: NOAA, Emergency Managers, General Public, USCG, Marine Navigation Community

WEATHER & WATER GOAL
NATIONAL WATER LEVEL PROGRAM (NWLP)

Improved Model Output by Data Validation

FY06:
NWLON Expansion & Enhancement to Real-Time

National Hurricane Center Utilization of Real-Time Storm Tide Data



USERS: NWS Forecast Offices & National Hurricane Center, NDBC

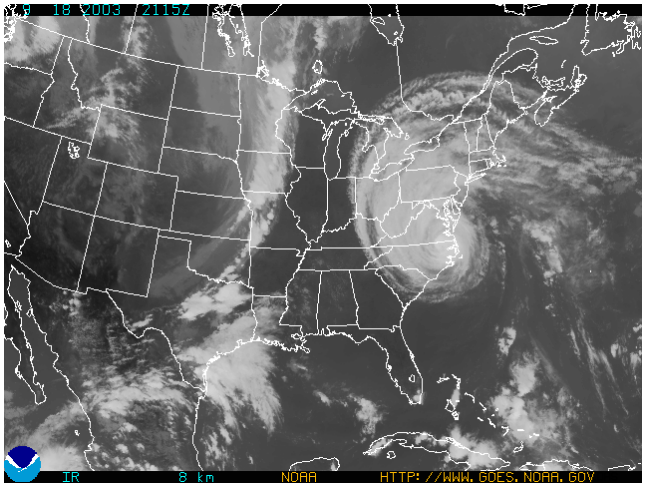
WEATHER & WATER GOAL

PHYSICAL OCEANOGRAPHIC REAL-TIME SYSTEM (PORTS)

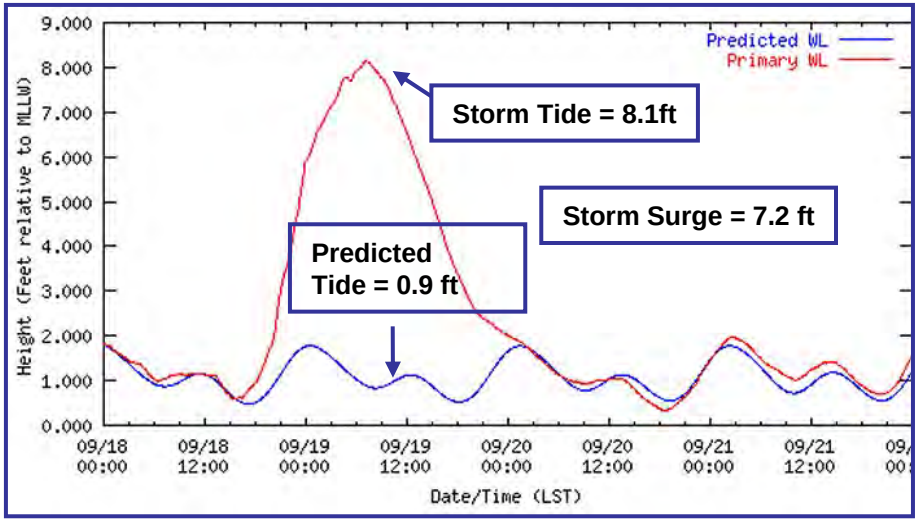
BENEFITS:
Coastal Community & Industry uses Real-Time Information to Make Critical Decisions

Real-Time Water Level System
Storm Surge Warning

Baltimore September 18-21, 2003



Hurricane Isabel



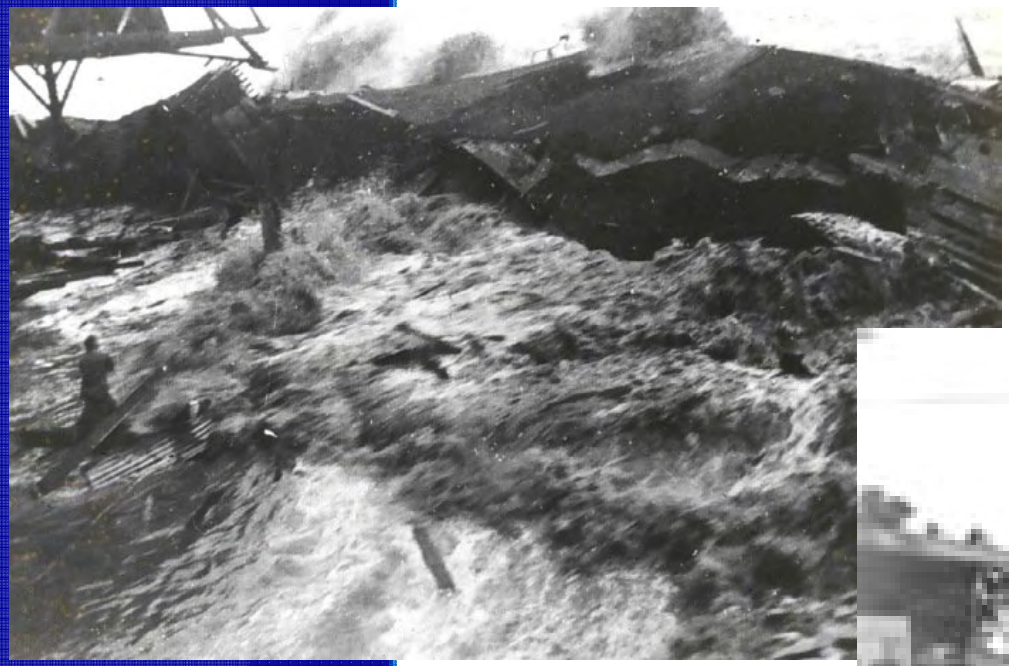
Storm Surge

Fells Point, Baltimore

USERS: Coastal Communities & Industry

WEATHER & WATER GOAL
NATIONAL WATER LEVEL PROGRAM (NWLP)

Tsunami Warning Network - What Started It All



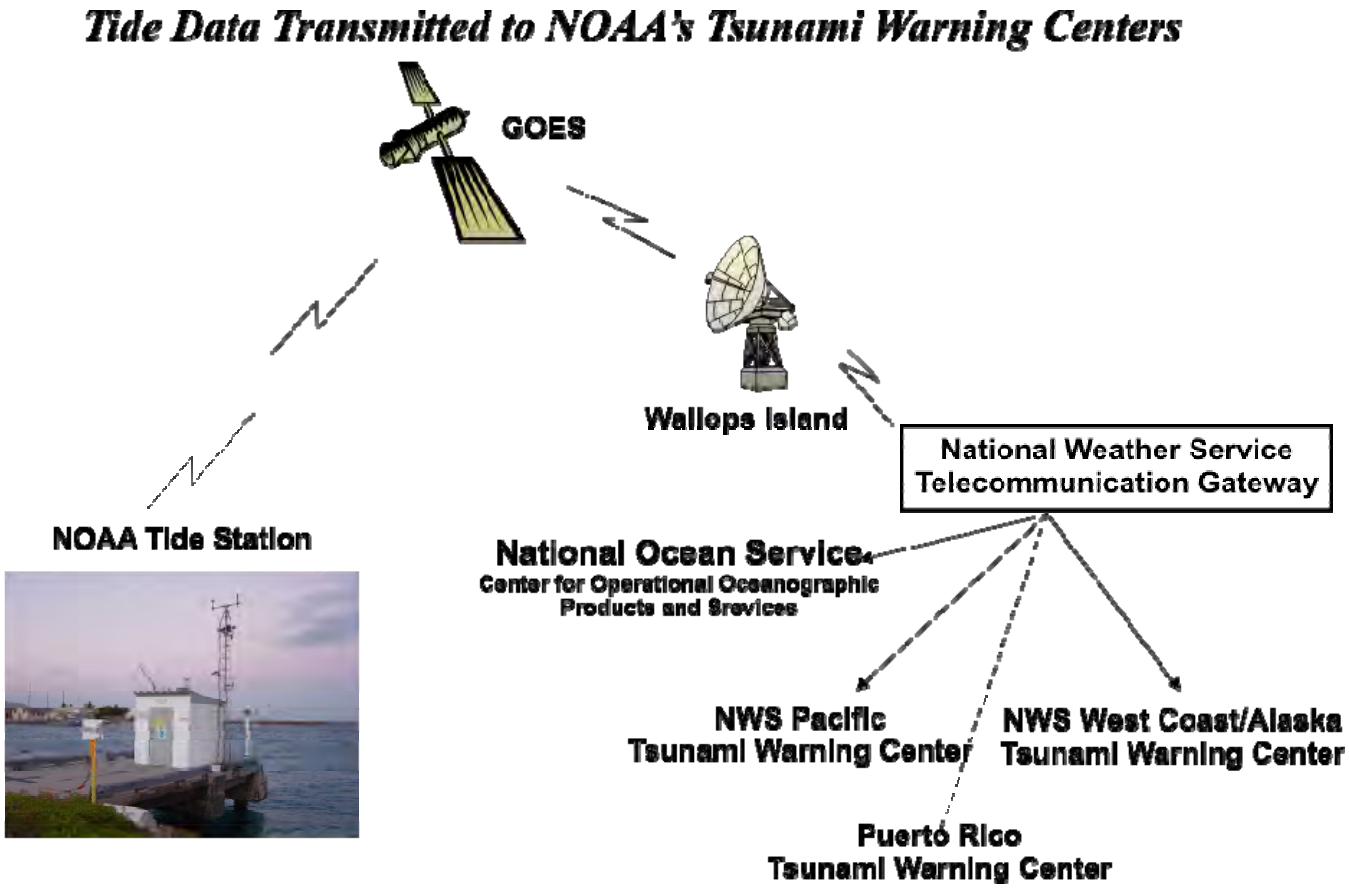
1946; Hilo, HI

USERS: Emergency Managers, Coastal Communities

WEATHER & WATER GOAL
NATIONAL WATER LEVEL PROGRAM (NWLP)

49 Tsunami Capable Stations that contribute to Tsunami Warning Network

FY06:
9 New Tsunami Water Level Stations – Pacific & Caribbean



USERS: NWS, Tsunami Warning Centers, Emergency Managers

COMMERCE & TRANSPORTATION GOAL OVERVIEW

The MARINE TRANSPORTATION SYSTEM

The Nation's network of oceans, lakes, rivers, canals, locks and dams

- **95,000 miles of U.S. coastline**
- **25,000 miles of navigable channels**
- **326 public/private ports, 3700 marine terminals**
- **Supports 13M jobs, contributes $718B to U.S. GDP**
- **78% of foreign trade in/out of U.S. by ship**
- **78M recreational boaters; $26B spent in FY00 for boaters**
- **Every U.S. citizen relies on the MTS: energy delivery, exports, transportation, cost-effective consumer goods, recreation, environmental protection**

U.S. Coast Guard

COMMERCE & TRANSPORTATION GOAL OVERVIEW

Energy Transportation

Oil [Crude and Finished]

•2000 Imports	4B barrels
•2000 Exports	379M barrels
•2000 U.S. Transship'd	2.6B barrels
Total	**7B Barrels**

Liquid Natural Gas

•1999 Imports	217.9 BCF
•1999 Exports	167.3 BCF
Total	**385.2BCF**

Coal

•2000 Imports	11M tons
•2000 Exports	58M tons
•2000 U.S. Transship'd	218M tons
Total	**287M tons**

COMMERCE & TRANSPORTATION GOAL

NATIONAL WATER LEVEL PROGRAM (NWLP)

3,142 TIDE PREDICTIONS ANNUALLY

187 NATIONAL WATER LEVEL STATIONS

BENEFITS:

- Prevents Commercial and Recreational Ship Groundings

FY06:

- 9 New Stations
- 50 Station Upgrades
  Year 2 of Upgrade to Real-Time Observations

USERS: Marine Transportation Community, USCG, USACE

COMMERCE & TRANSPORTATION GOAL

NATIONAL WATER LEVEL PROGRAM (NWLP)

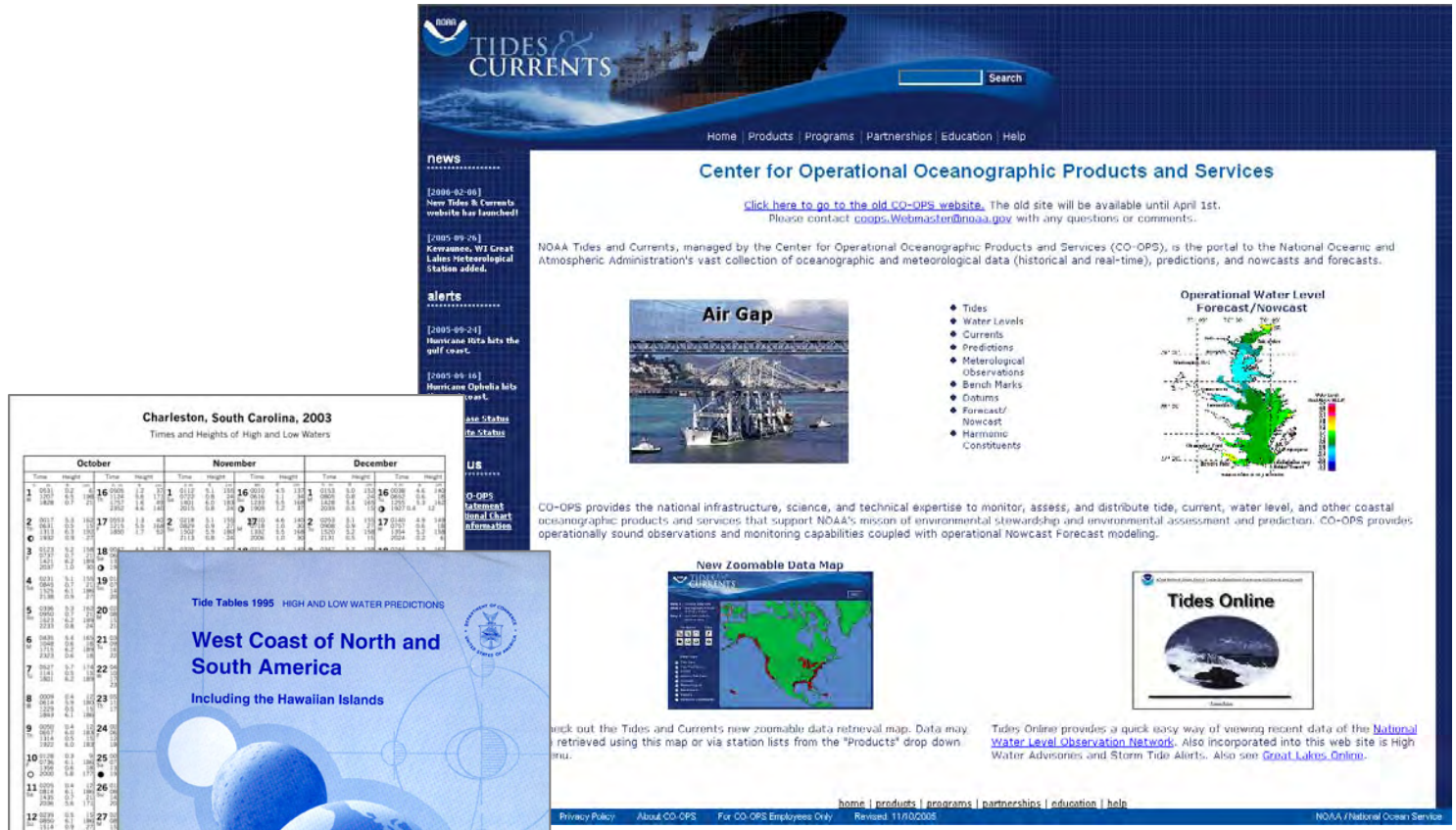
Number 1 NOS Website

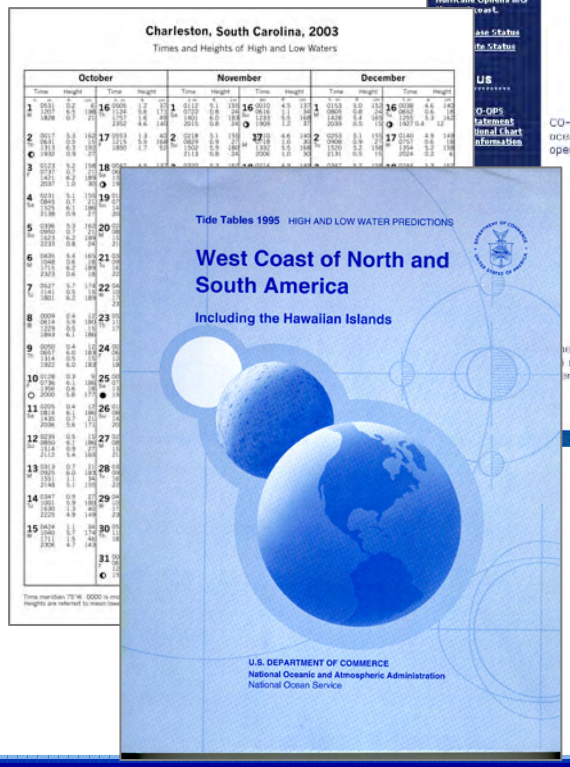
PRODUCTS:

Tides & Current Predictions

Real-Time Water Level & Current Information

National Sea Level Trends





WEB SITE
Over 2 million hits during IVAN

Federal Law Requires all Commercial Vessels to carry Tide & Current Predictions

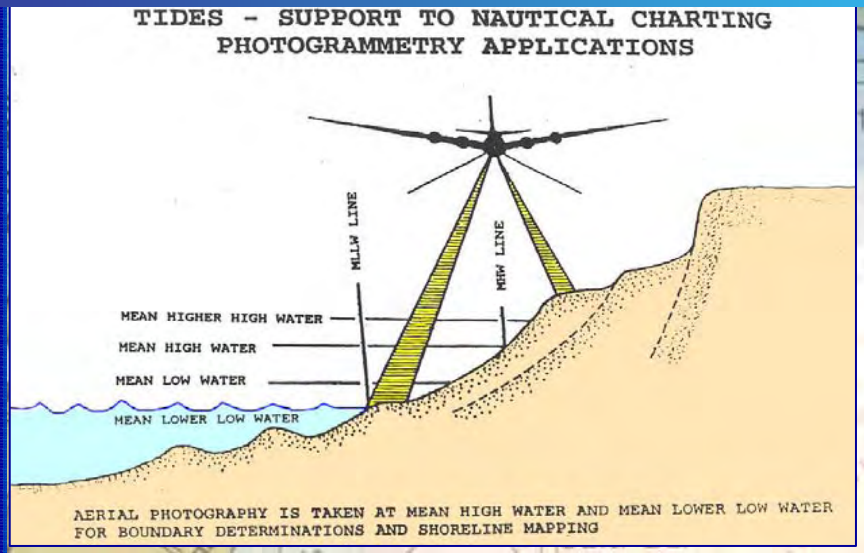
USERS: Marine Transportation Users, Academic Institutions, USCG, USACE

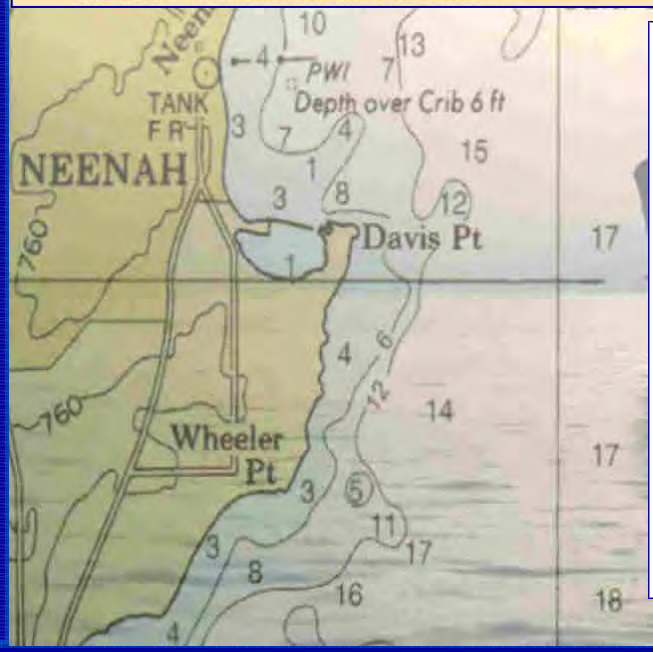
COMMERCE & TRANSPORTATION GOAL

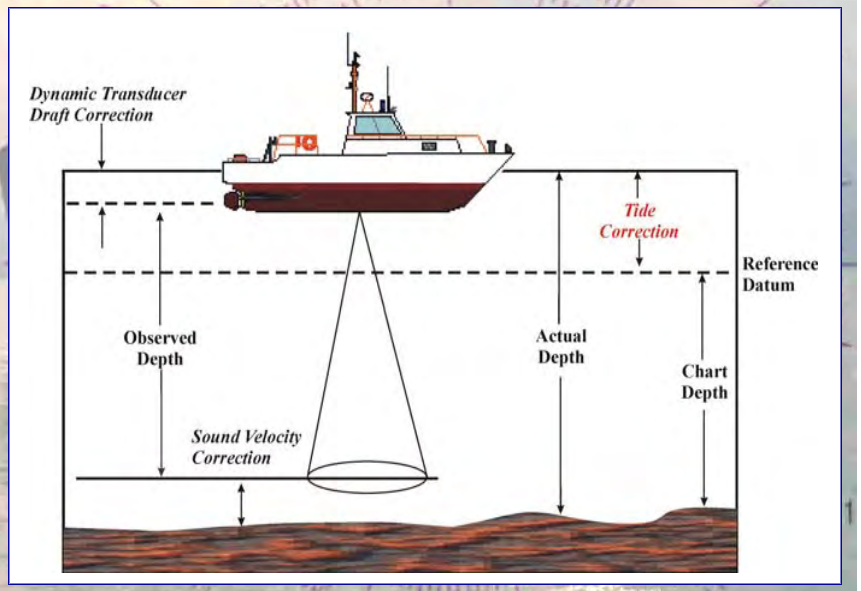
NOAA MISSION SUPPORT

BENEFITS:

- Chart Datums
- Shoreline Mapping







USERS: OCS, NGS

COMMERCE & TRANSPORTATION GOAL

MARINE BOUNDARIES

BENEFITS:

- Federal & State Boundary Dispute Resolution

Tidal I

GREENWOOD CREEK, EASTERN SHORE, MD

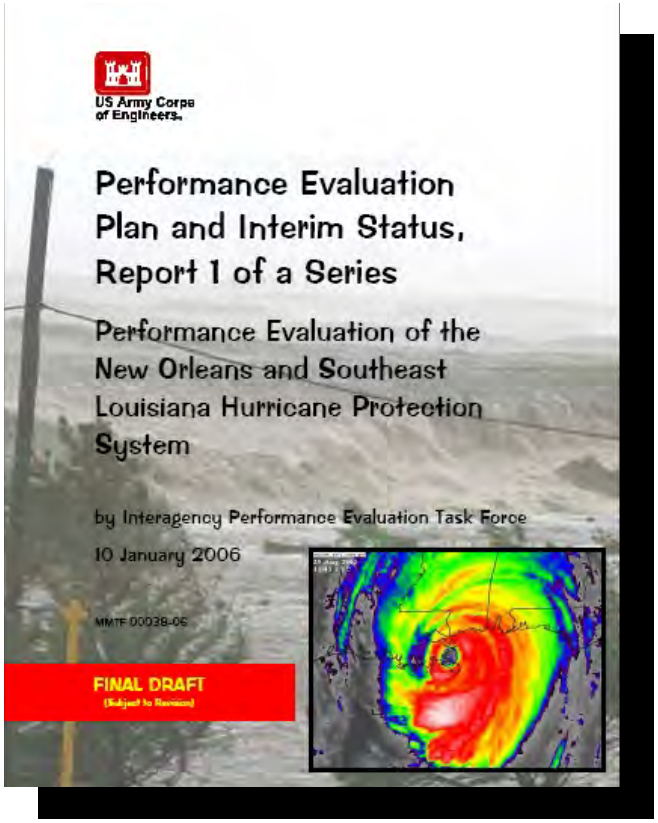
USERS: DOJ, NOAA, USGS, State/Local Governments, Surveyors, Engineers

COMMERCE & TRANSPORTATION GOAL
PARTNERSHIPS AND USERS

BENEFITS:
- Coastal Engineering Support

FY06:
Evaluate Adequacy of New Orleans Levels

NOAA is Providing Water Level Support to USACE in Rebuilding Hurricane Protection Systems



USERS: US Army Corps of Engineers

COMMERCE & TRANSPORTATION GOAL

NATIONAL CURRENT OBERVATION PROGRAM (NCOP)

BENEFITS:
Marine Transportation Safety
- Search & Rescue
- Coastal Engineering
- Recreational Boating Safety

FY06:
70 Tidal Current Surveys

1st Year of Program Revitalization

2, 821 TIDAL CURRENT PREDICTIONS ANNUAL

- **70% of the stations are over 30 years old**

USERS:

COMMERCE & TRANSPORTATION GOAL

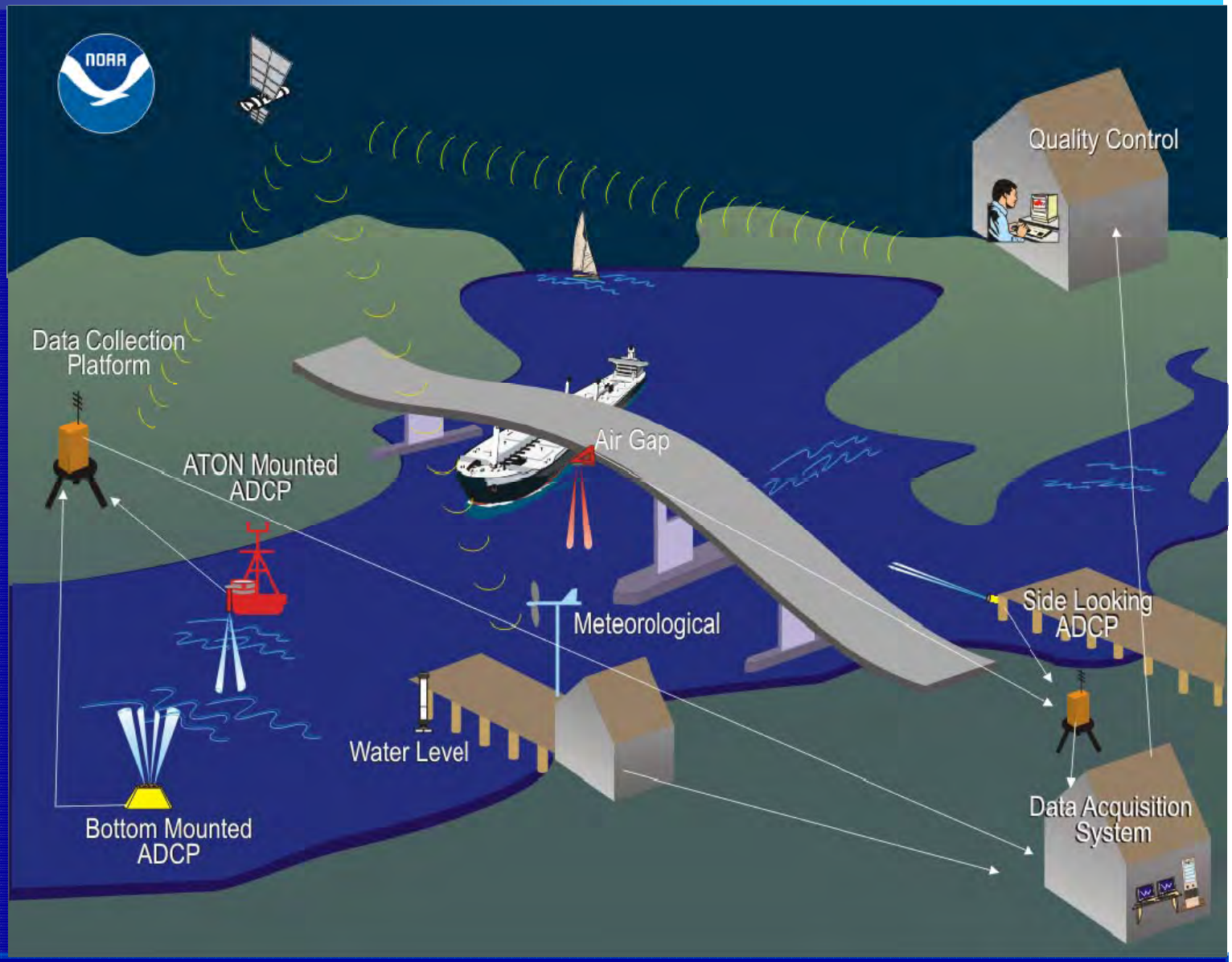
PHYSICAL OCEANOGRAPHIC REAL-TIME SYSTEM (PORTS)

BENEFITS:

13 Real Time Networks throughout the Nation (37 Sea Ports)

FY06:

Funding Issue



USERS:

COMMERCE & TRANSPORTATION GOAL

PHYSICAL OCEANOGRAPHIC REAL-TIME SYSTEM (PORTS)

BENEFITS:

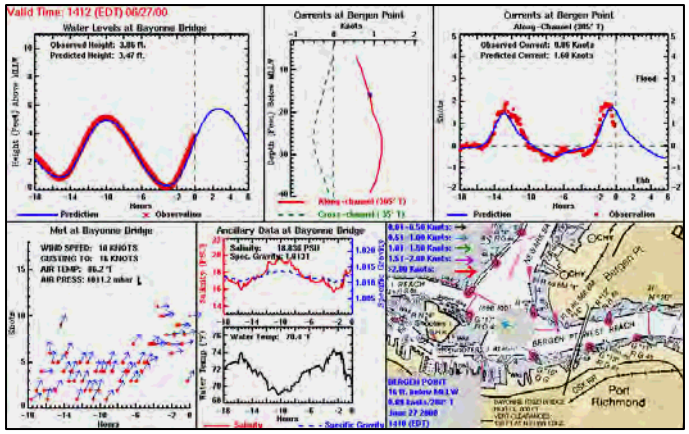
- Access to the data via internet, and voice
- All data updated at 6-minute intervals
- All quality controlled

TYPICAL PORTS SITE PROVIDES:

1-866-CHPORTS

New York/New Jersey Harbor PORTS Text Screen

```
 New York Harbor and New Jersey PORTS, NOS at  2:00 pm EDT  June  3, 2004
------------- TIDES ---------------------------- CURRENTS --------------------
Bayonne Bridge  0.6 ft.,Falling: Bergen Point          ********************
Kings Point     7.1 ft.,Falling: Bayonne Bridge predicted    1.0 kts.(E), 080°T
The Battery     1.1 ft.,Falling: The Narrows           ********************
Sandy Hook      0.0 ft.,Falling:
                                 :       (F)lood, (S)lack, (E)bb, towards °True
-------------------- Wind Speed/Dir -------------------Air Pressure  Air Temp-
Bayonne Bridge       3 knots from WNW, gusts to  10     1016 mb          73°F
Sandy Hook             Calm                             1016 mb,Falling
Robbins Reef         ********************               ***************  *****
Kings Point          8 knots from NW , gusts to  13     1016 mb,Falling   71°F
---------------- Salinity -- S.G. -- Water Temp ----------------------------
Bayonne Bridge    16.2 psu   1.011       68°F
Sandy Hook        ********   *****       68°F
Kings Point                              62°F
-------------------------------------------------------------------------------
 **** - Data not displayed as a result of quality control monitoring. For more
 information, go to http://co-ops.nos.noaa.gov/corms_status.html, or call CORMS
 at 301-713-2540.
```



COMMERCE & TRANSPORTATION GOAL OVERVIEW

Ship Captains Use the Real-Time Information to Make Operational Decisions While Underway

Captain Larry Stoltz of the Edgar B. Spear

When we load, we call the voice system to see what the water level is doing. Every inch of draft is equal to 237 long tons. When we get closer to the Soo, we call again. We use it a lot and it's been invaluable.

USERS: Marine Transportation Community, USCG, USACE, USN

COMMERCE & TRANSPORTATION GOAL
PHYSICAL OCEANOGRAPHIC REAL-TIME SYSTEM (PORTS)

NOAA STUDY SHOWS VALUE OF PORTS® PROGRAM TO MARINE TRANSPORTATION INDUSTRY
Tampa Bay System Is First to Quantify Economic Benefits

Jan. 5, 2006 — The Tampa Bay economy receives more than $7 million a year in savings and direct income from the operation of the Physical Oceanographic Real-Time System (PORTS®), according a new NOAA sponsored study. The report details the first study of the navigational aid, which is in operation at 13 major ports across the United States. **(NOAA image of PORTS® system. Please credit "NOAA.")**

Tampa's PORTS® system provides accurate real-time oceanographic information tailored to the specific needs of the 6,700 commercial vessels transiting Tampa Bay each year.

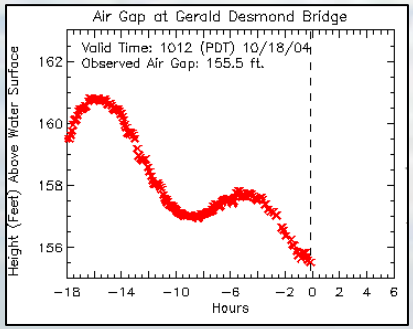
"The PORTS® system is a good example of how research and observing system development expertise can be applied to support safe, efficient and environmentally sound marine transportation," said retired Navy Vice Admiral Conrad C. Lautenbacher, Jr., Ph.D., undersecretary of commerce for oceans and atmosphere and NOAA administrator.

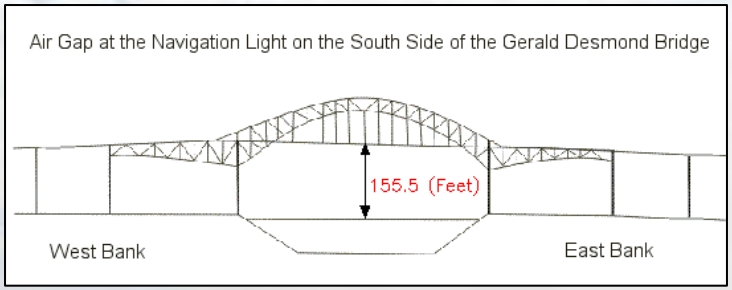
COMMERCE & TRANSPORTATION GOAL

PHYSICAL OCEANOGRAPHIC REAL-TIME SYSTEM (PORTS)

Gerald Desmond Bridge Long Beach, CA

USERS:





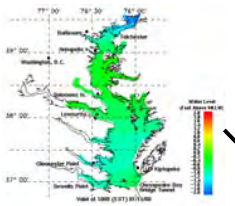
“Failure is not an option..”
Apollo 13

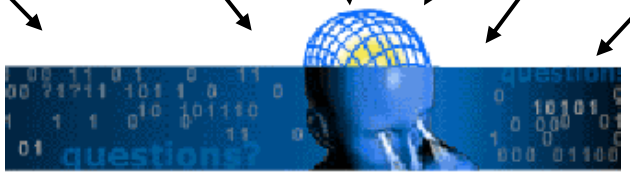
COMMERCE & TRANSPORTATION GOAL

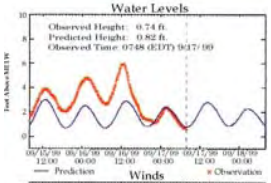
CONTINOUS OPERATING REAL-TIME SYSTEM (CORMS)

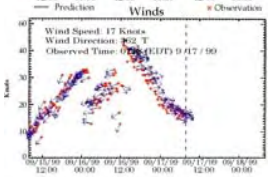
BENEFITS:
Accountability
Liability

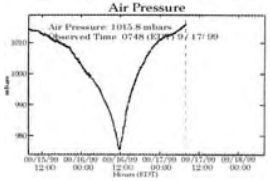
CORMS AI











195 Unique Sensor

KNOWLEDGE AQUISITION

EXPERT RULES/CASES

KNOWLEDGE BASE DECISIONS

QUALITY CONTROLLED INFORMATION

(24 x7)

USERS: Marine Navigation Community

COMMERCE & TRANSPORTATION GOAL

CONTINOUS OPERATING REAL-TIME SYSTEM (CORMS)

A Safe Alternative to Quality controlled Information

COMMERCE & TRANSPORTATION GOAL
NATIONAL COASTAL MODELING PROGRAM

Simulated and Forecasted Water

BENEFITS:

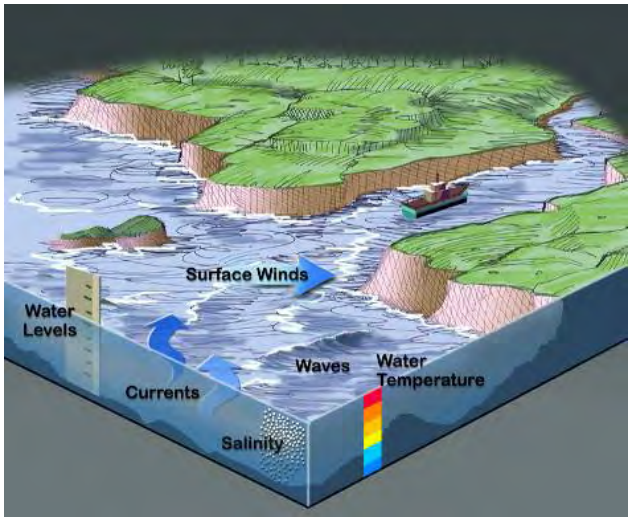
Prevents Ship Groundings

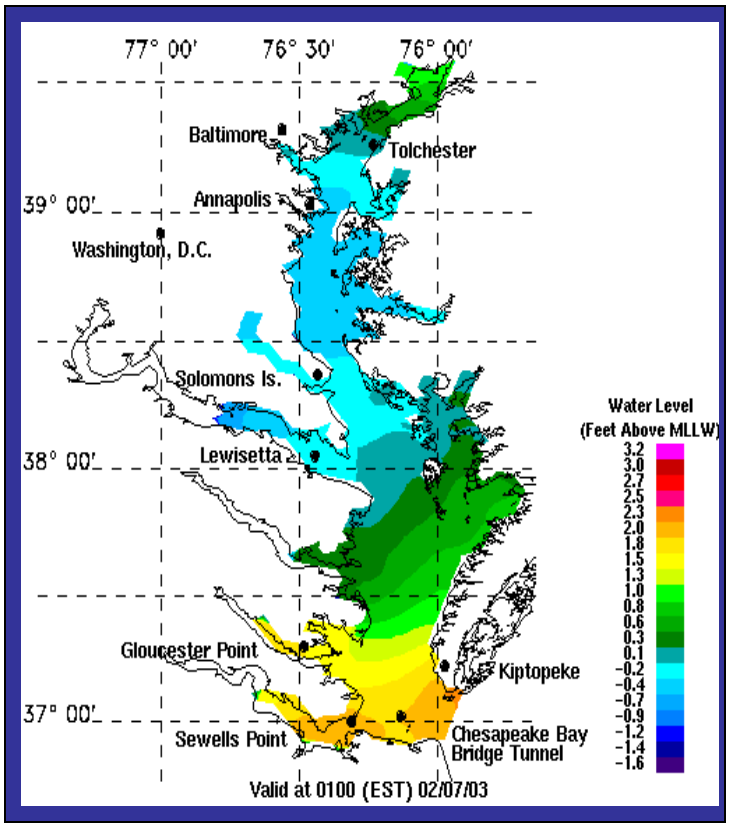
Increases Economic Viability of Marine Cargo Shipping Industry

FY06:

3 New Operational Forecast Models

Operability of Models on NCEP HPC





USERS: *Navigation Community, Coastal Community, NWS Forecast Offices*

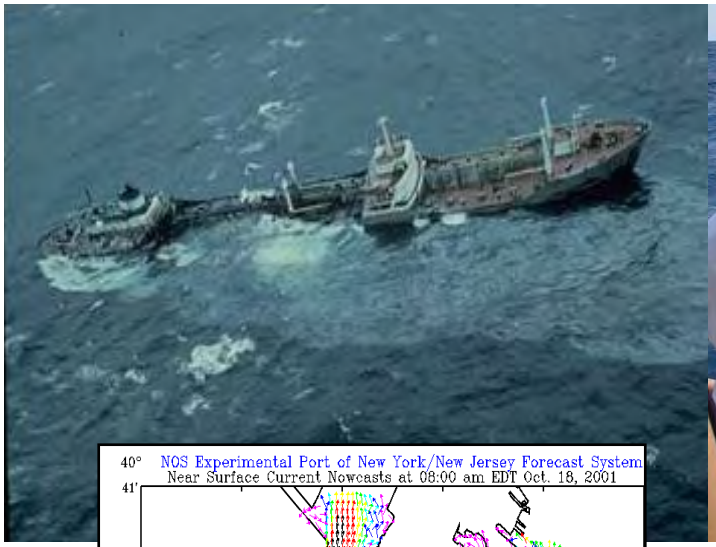
COMMERCE & TRANSPORTATION GOAL

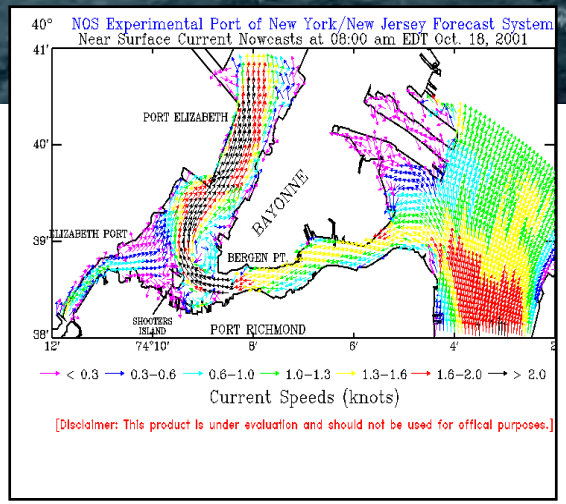
HAZARDOUS MATERIALS RESPONSE

Over 50% Cargo is Oil or Hazardous Material

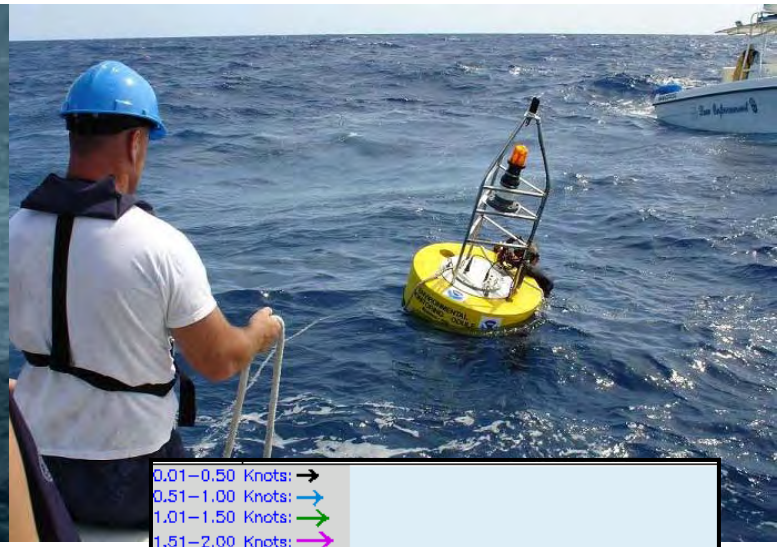
FY06:
Development of Quick Response Emergency Buoy

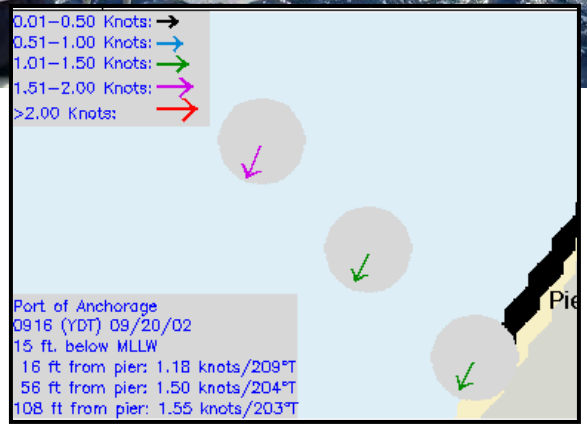
National Coastal Modeling Program





National Current Observation Program





USERS: ORR, USCG, USFWS, Emergency Responders, Local Government

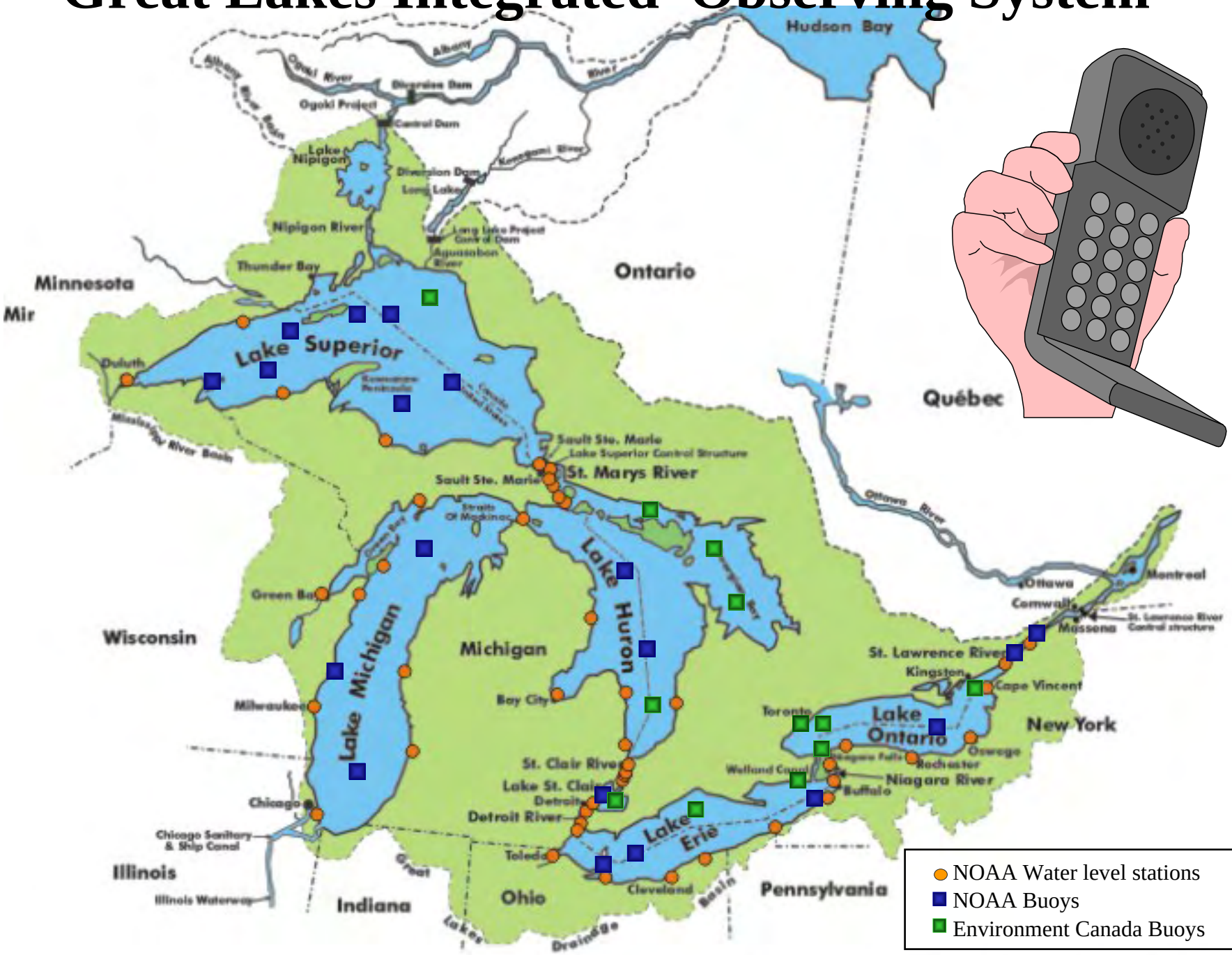
IOOS & PARTNERSHIPS
IOOS WEB PORTAL

Benefits:

Identifies Data Standards

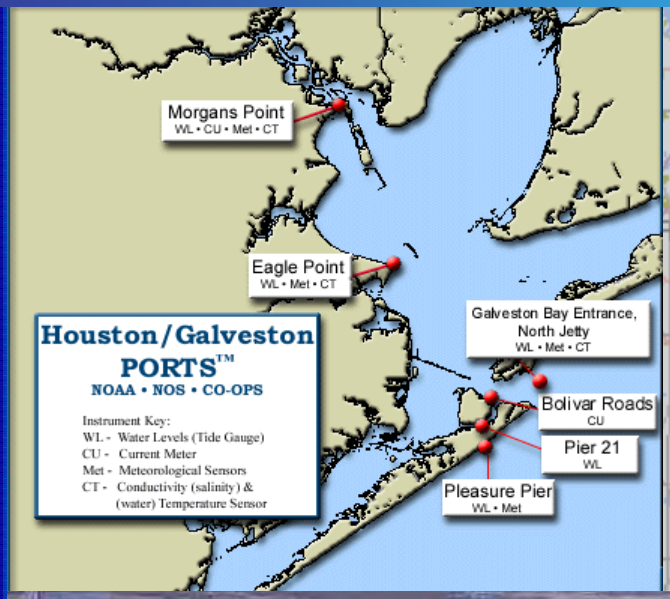
PARTNERS: NDBC, CSC

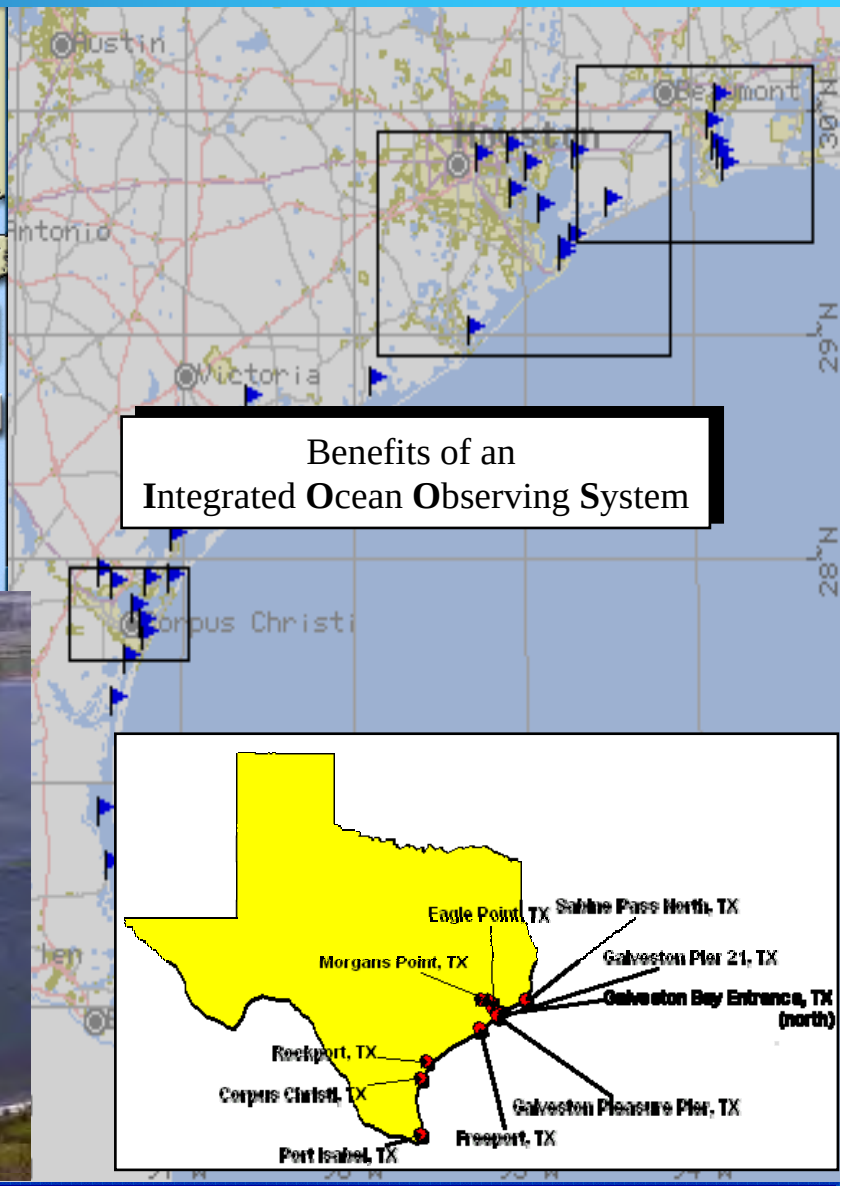
Great Lakes Integrated Observing System



IOOS & PARTNERSHIPS

IOOS & PARTNERS

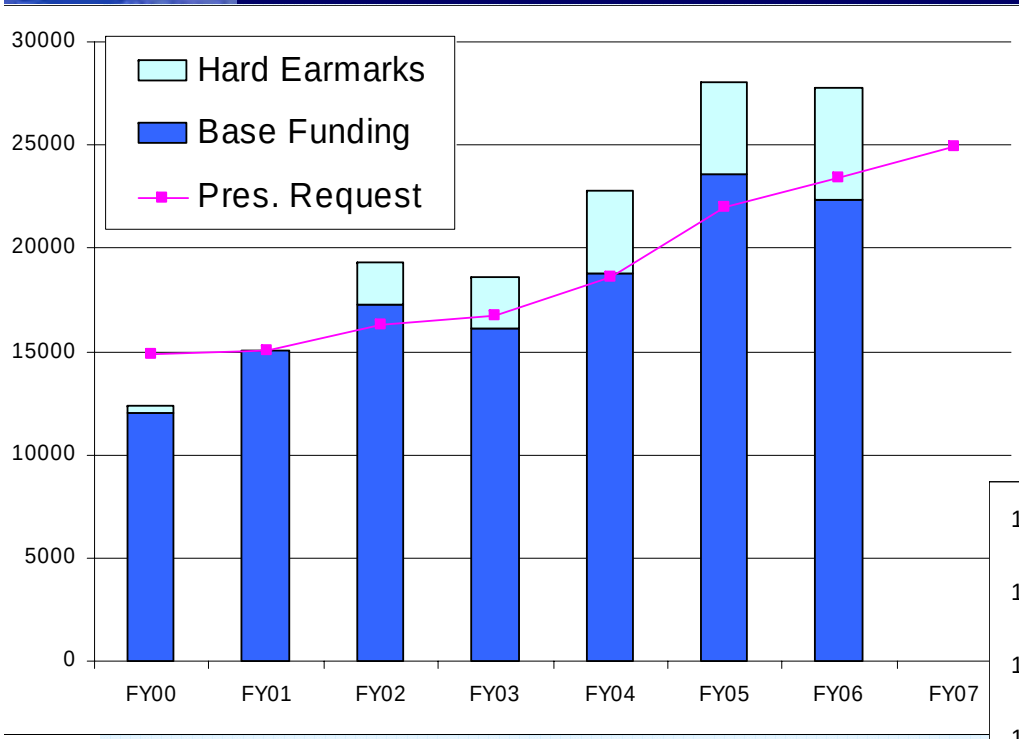


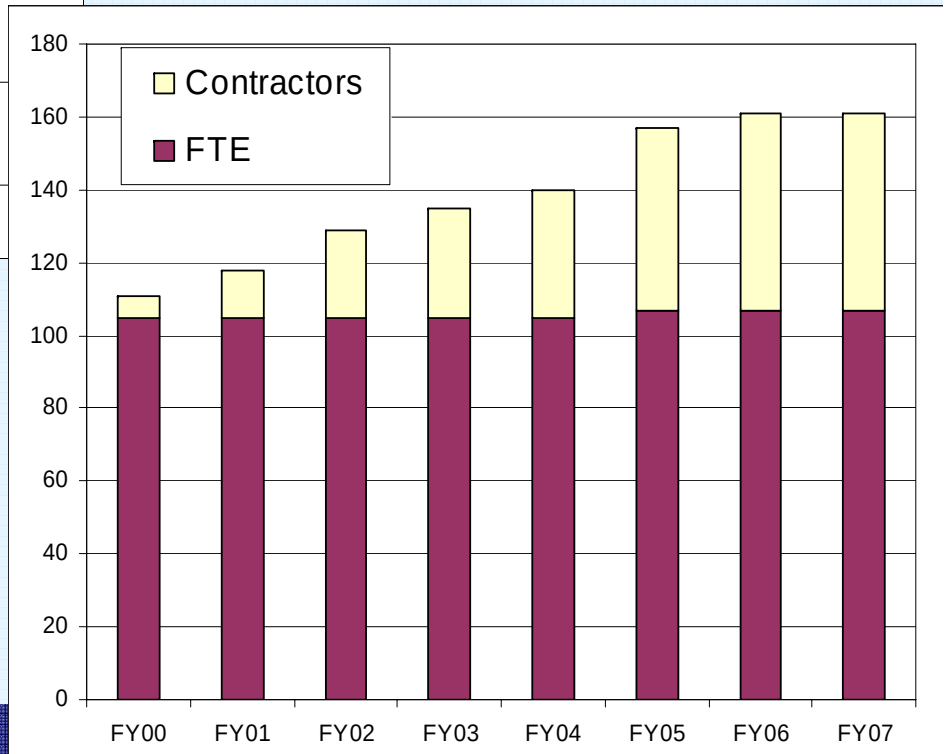


CO-OPS NEW BUSINESS MODEL

CO-OPS NEW BUSINESS MODEL

GROWTH IN MISSION, GOALS & BUDGET





Where are we going?

5 Year Strategic Plan Development

Examples:

Ecosystems: **Science Based Restoration**

Climate: **Global Sea Level Analysis**

W&W: **Enhanced Tsunami Network**

C&T: **National Real-Time Water Level Network**

THE STRATEGIC PLAN FOR THE
Center for Operational Oceanographic Products and Services

HOW DO WE GET THERE?

Internal Assessment

- **IMPROVED COMMUNICATIONS**
  - Weekly Newsletter and Intranet
  - All Hands Meetings
  - Employee Feedback Mechanisms
- **IMPROVED PLANNING**
  - Quarterly Planning Meetings
  - MS Project Tracking
- **IMPROVED DAY-TO-DAY OPERATIONS**
  - “Reliable Operating System”

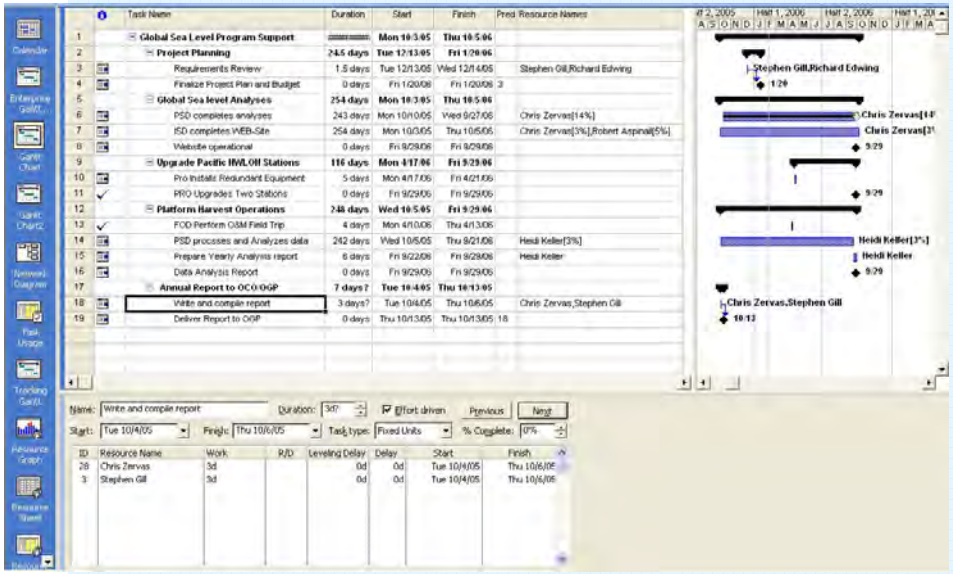
FISCAL YEAR PLANNING:

- **Aligning to NOAA Program Goals & PPPBES Guidelines**
- **Planning for 80% Capacity for day-to-day operations**
- **Planning for 20% Responsiveness (i.e. Hurricanes, Tsunami's, Ship Groundings)**
- **Assessment and Quarterly Reviews**

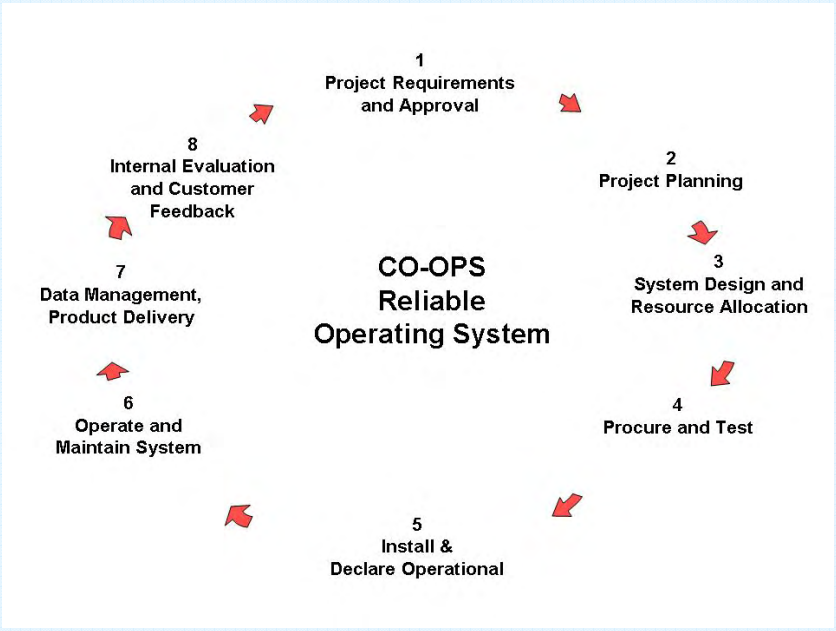
CO-OPS NEW BUSINESS MODEL

NEW TOOLS FOR PLANNING & IMPLEMENTATION

MS PROJECT



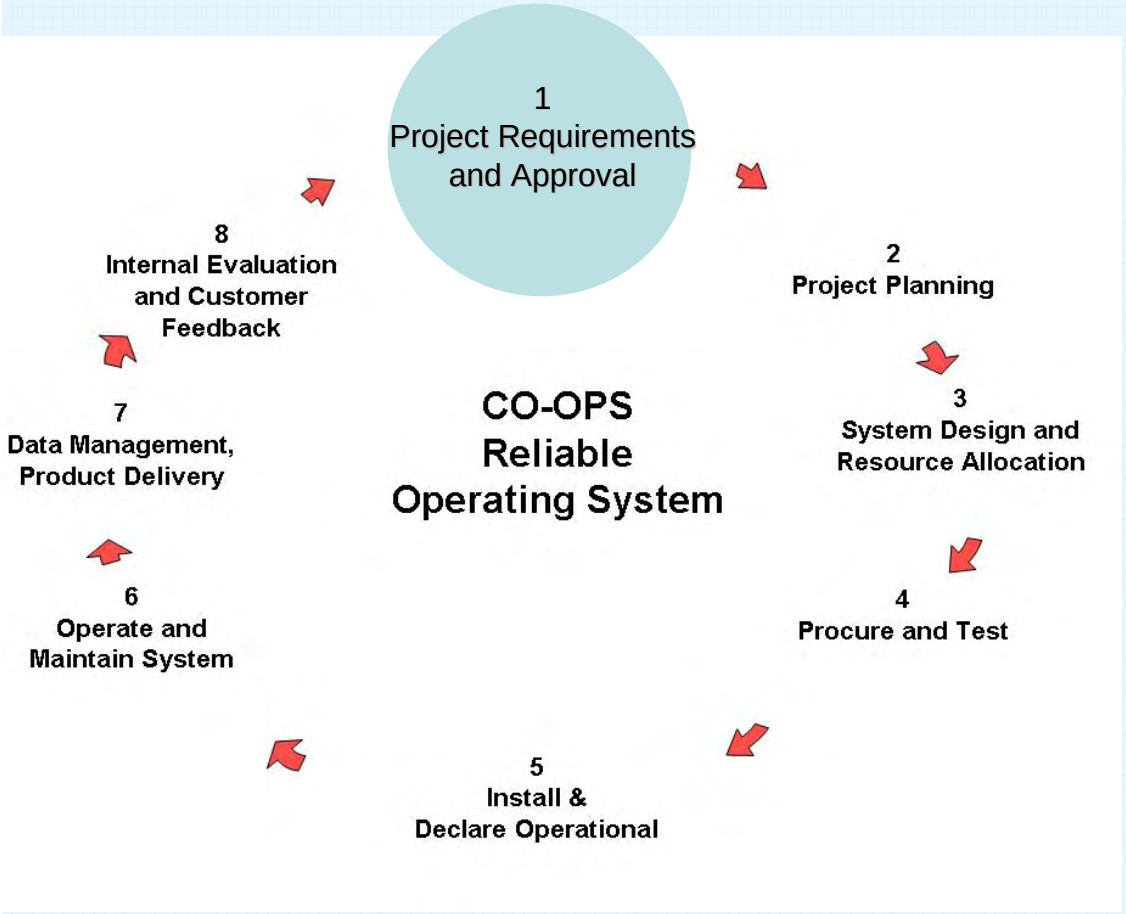
"RELIABLE OPERATING SYSTEM"



- **Improved Resource Management**
- **Tracks Project Milestones**
- **Improved Human Resource Management**
- **Executive Dashboard "Quad Charts"**

CO-OPS RELIABLE OPERATING SYSTEM

SYSTEMATIC APPROACH TO BUSINESS



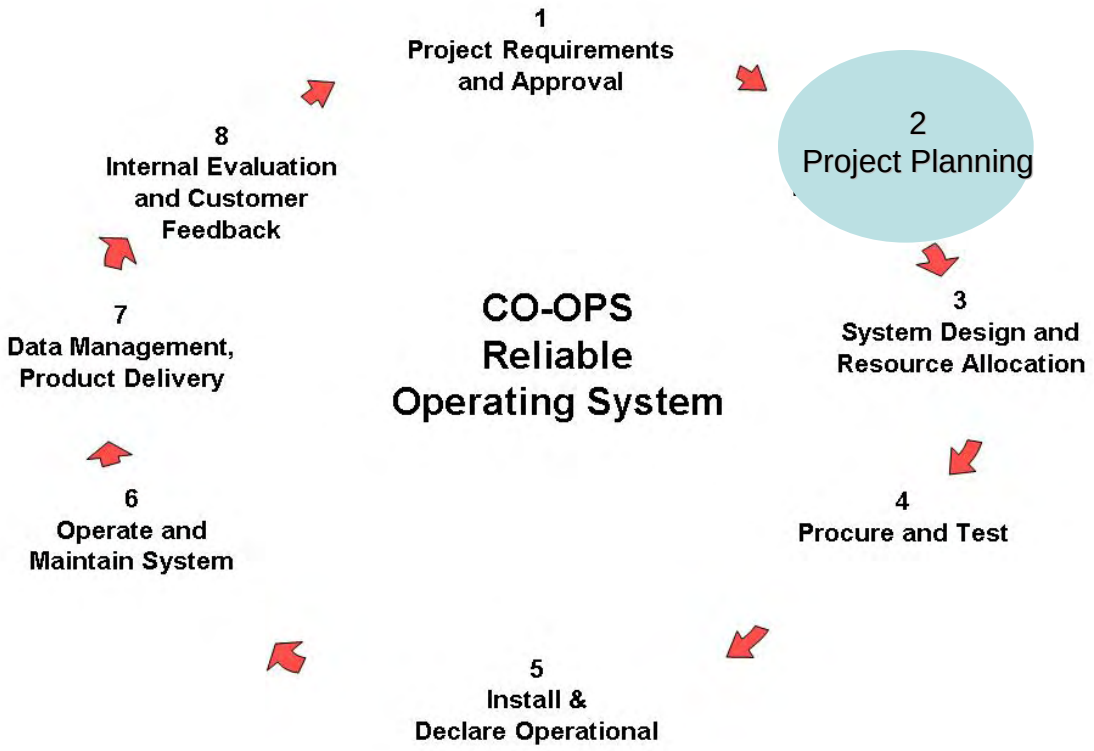
Focused Process for handling external requirements

Requirements identified very early in the process

The Process ensures timely response to customers

CO-OPS RELIABLE OPERATING SYSTEM

NEW TOOLS FOR PLANNING & IMPLEMENTATION



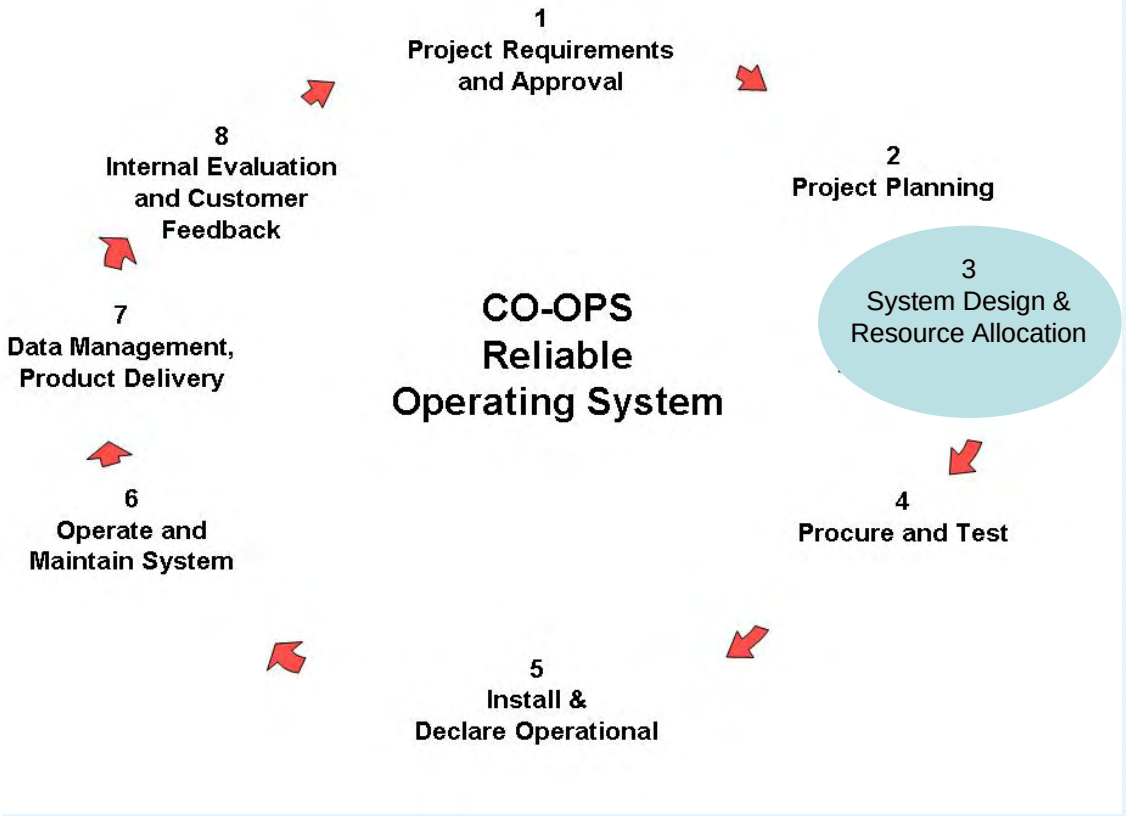
Planning Team builds detailed project plan

All parts of CO-OPS are involved in developing the Plan

MS PROJECT plan includes start and finish dates, people assigned

CO-OPS RELIABLE OPERATING SYSTEM

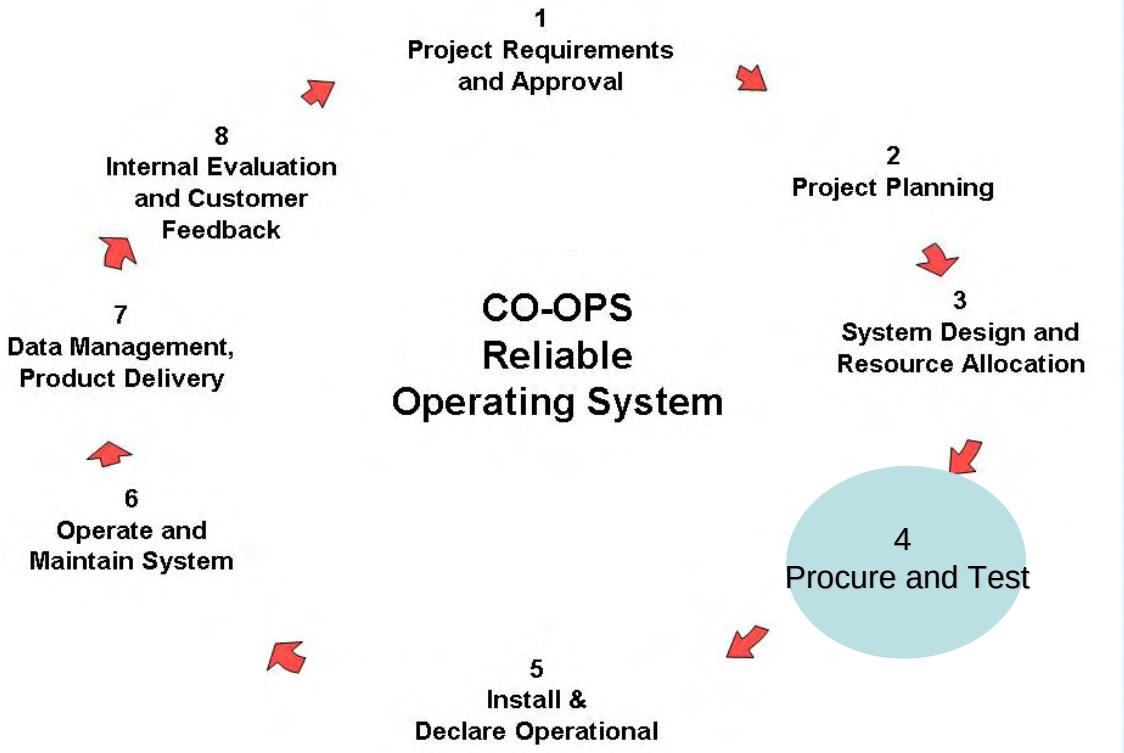
SYSTEMATIC APPROACH TO BUSINESS



Engineering Plan approved by Configuration Board

CO-OPS RELIABLE OPERATING SYSTEM

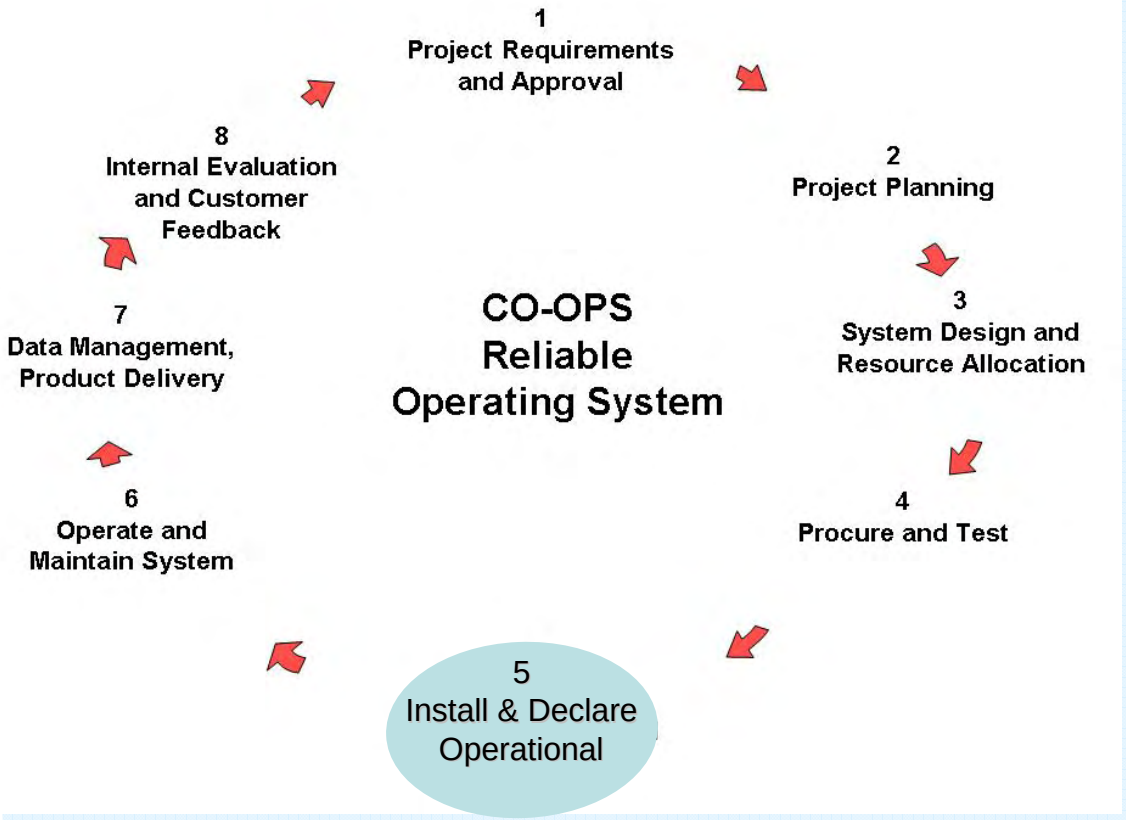
SYSTEMATIC APPROACH TO BUSINESS



Thorough system testing (instrument to product) before release for installation

CO-OPS RELIABLE OPERATING SYSTEM

SYSTEMATIC APPROACH TO BUSINESS

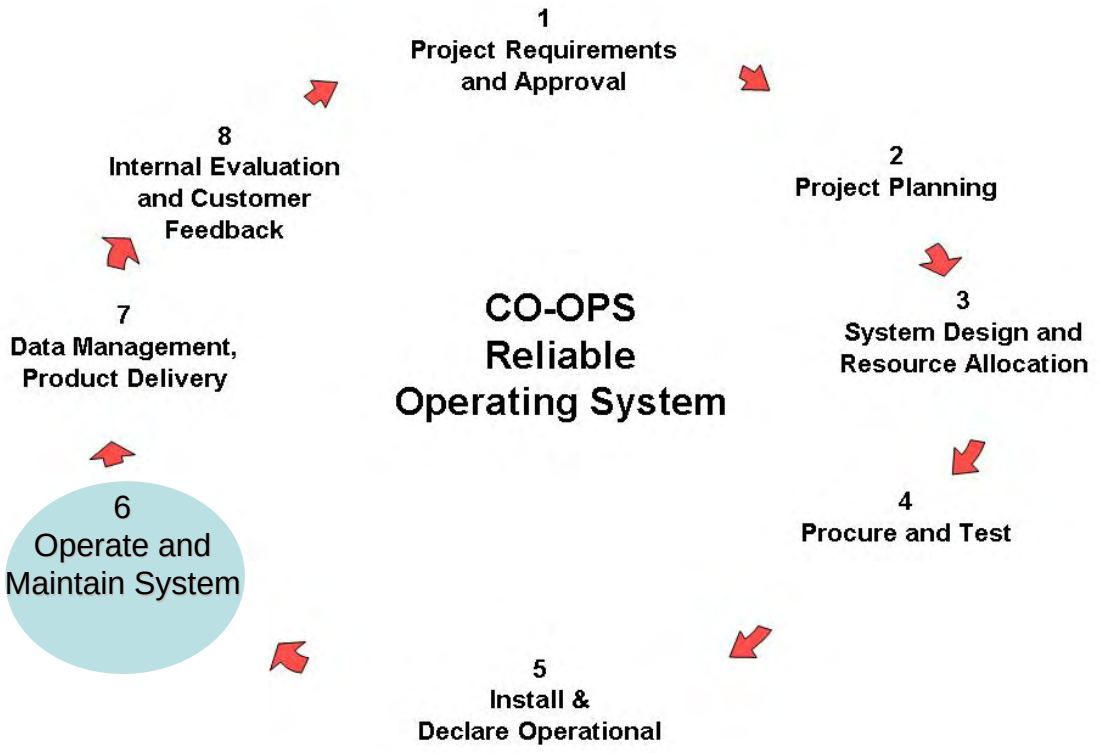


Installation date set in project plan

Operational certification process

CO-OPS RELIABLE OPERATING SYSTEM

SYSTEMATIC APPROACH TO BUSINESS

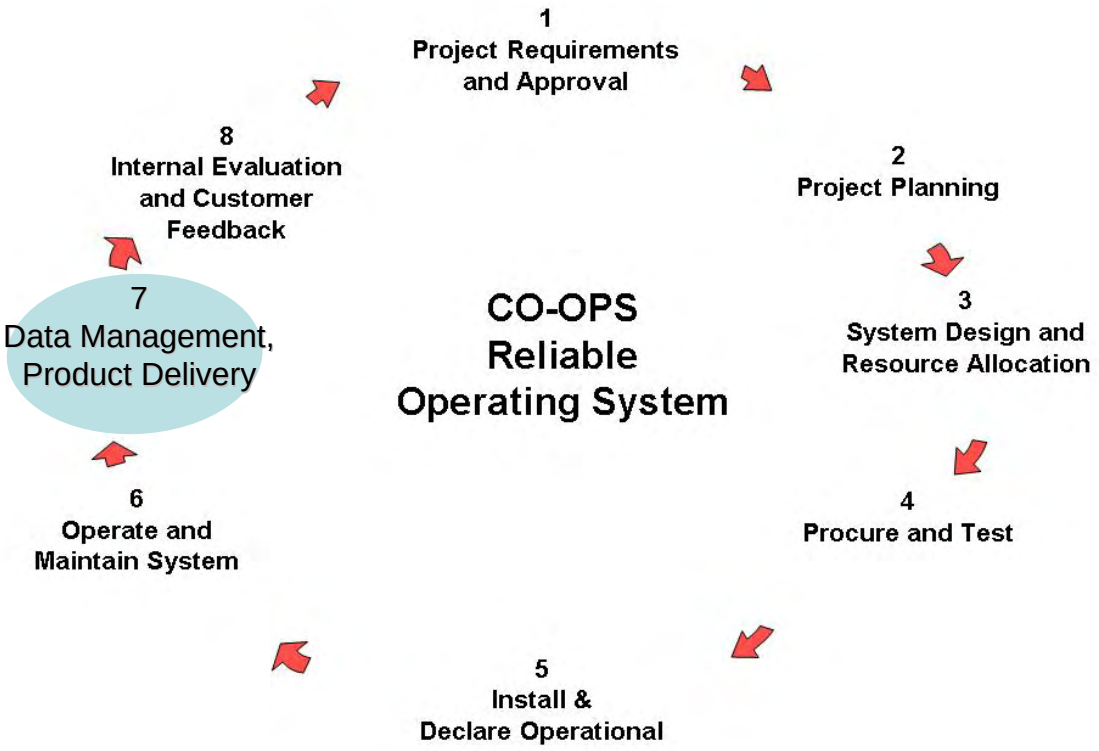


Inspection Process

- Periodic review of maintenance records
- Periodic system inspection

CO-OPS RELIABLE OPERATING SYSTEM

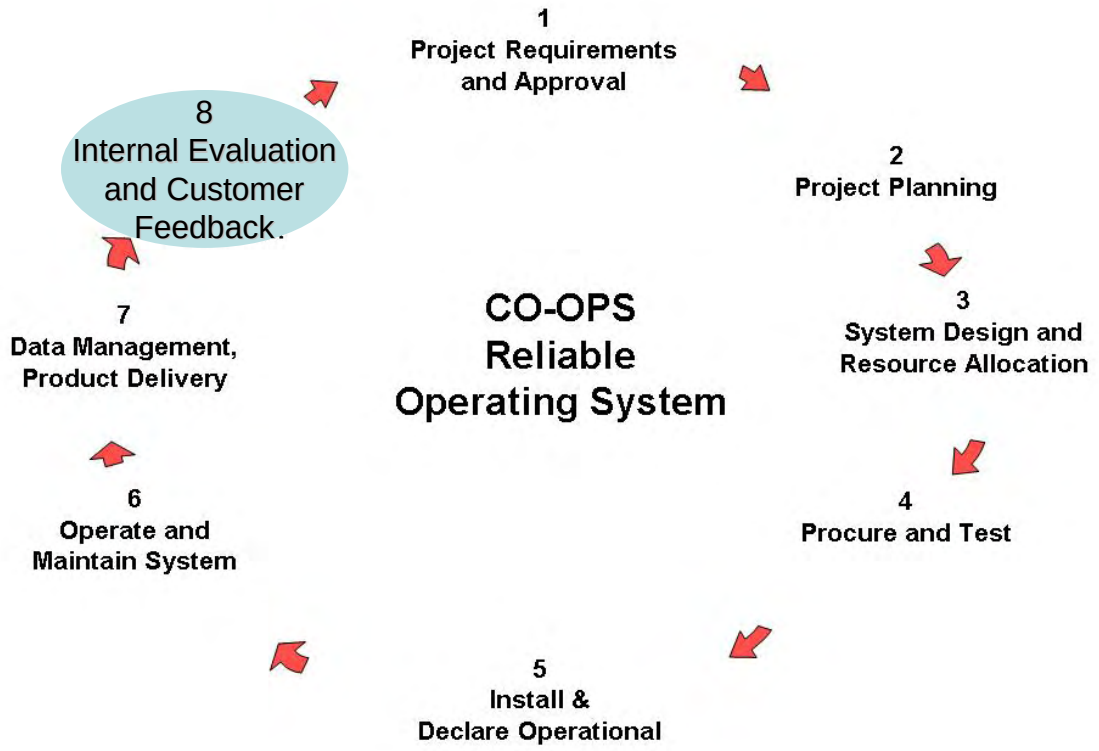
SYSTEMATIC APPROACH TO BUSINESS



More thorough oceanographic analysis of real-time systems

CO-OPS RELIABLE OPERATING SYSTEM

SYSTEMATIC APPROACH TO BUSINESS

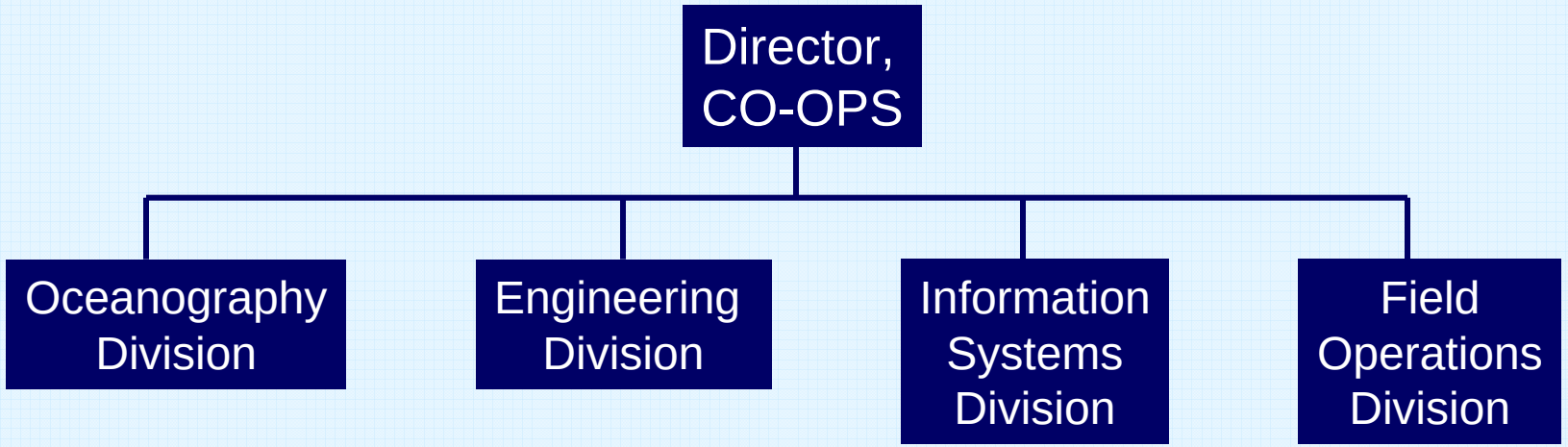


Formal customer feedback system

QA system to identify root cause and develop solutions

EMPLOYEE AND DIVISION ALIGNMENT

- **Realign Personnel to Functional Organization**
- **Address Growth with Smart Contracting**
- **Establish Product Line Managers**



AA ORIENTATION

A SUMMARY OF YOUR QUESTIONS

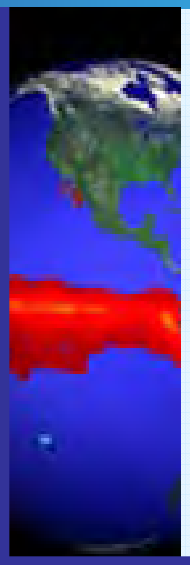
AA ORIENTATION

5 Things NOAA Needs for CO-OPS to Accomplish this Fiscal Year

ECOSYSTEMS

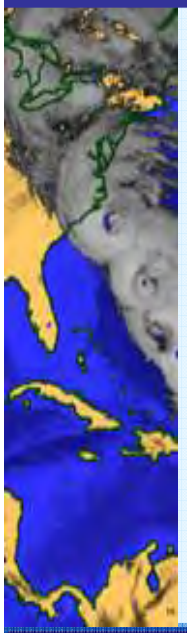
Provide Operational Harmful Algal Bloom Forecast

Enhanced Science Based Habitat Restoration



CLIMATE

Provide Global Sea Level Analysis



WEATHER & WATER

Provide Real-Time Storm Tide

Support Tsunami Systems

COMMERCE & TRANSPORTATION

Support Gulf of Mexico Recovery

Support Safe & Efficient Maritime Commerce

AA ORIENTATION- NOAA FY06 DELIVERABLES

MAJOR DELIVERABLES

WEATHER & WATER

9 New Tsunami Water Level Stations

3 Operational Forecast Models

Demonstrate Operability of Models on NCEP HPC

COMMERCE & TRANSPORTATION

50 National Water Level Station Upgrades

3 Tidal Current Surveys

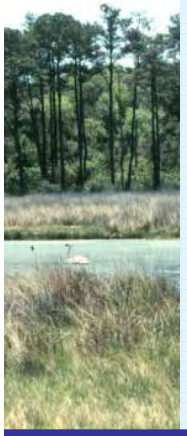
(70 Observations)

ANTICIPATED DELAYS:

None at this time. However, CO-OPS is breaking new ground establishing NOS models on NCEP HPC.

AA ORIENTATION- NOAA FY06 DELIVERABLES

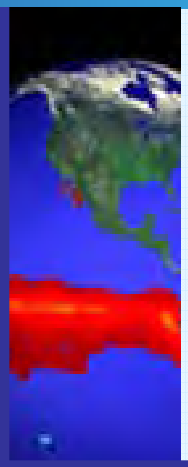
CO-OPS ROLE IN GOAL TEAMS & PROGRAMS



ECOSYSTEMS

HABITAT: Kristen Tronvig

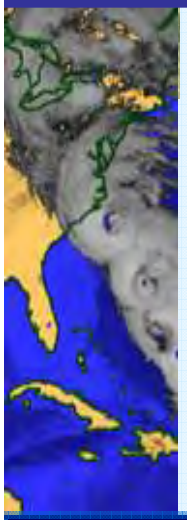
ECOSYSTEM RESEARCH: Mark Vincent



CLIMATE

CLIMATE OBSERVATION:

Steve Gill



WEATHER & WATER

TSUNAMI: Mike Szabados

CEO: Rob Bassett

EMP: Mark Vincent

NOS Liaison Goal Team: Dave MacFarland

COMMERCE & TRANSPORTATION

MTS: Rich Edwing (PM)

EMERGENCY RESPONSE:

Peter Stone

OTHER PROGRAMS: NOAA Lead on CCSP Goal 4.1 Deliverable: Mike Szabados
NOS Representative on NOSC: Mike Szabados
Hydrography Major Project: Rich Edwing
IOOS Advisory Panel: Rich Edwing

AA ORIENTATION

"It seems a very simple task to make correct tidal observations;
but, in all my experience,
I have found no observations which require such constant care and attention...."

Alexander Dallas Bache,
Second Superintendent of the Coast Survey, 1854